

RECENT ADVANCES IN BIOLOGICAL SCIENCES

EDITOR

Meryem Burcu KÜLAHCI

AUTHORS

Ali Fazıl YENİDÜNYA

Betül AYDIN

Didem CORAL ŞAHİN

Irmak POLAT

İlkay ÇORAK ÖCAL

Leyla AÇIK

Mehmet BEKTAŞ

Meryem Burcu KÜLAHCI

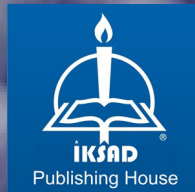
Nazife YİĞİT KAYHAN

Neslihan BAL

Pınar ARSLAN

Serap ÇETİNKAYA

Sumru ÇITAK



RECENT ADVANCES IN BIOLOGICAL SCIENCES

EDITOR

Meryem Burcu KÜLAHCI

AUTHORS

Ali Fazıl YENİDÜNYA

Betül AYDIN

Didem CORAL ŞAHİN

Irmak POLAT

İlkay ÇORAK ÖCAL

Leyla AÇIK

Mehmet BEKTAŞ

Meryem Burcu KÜLAHCI

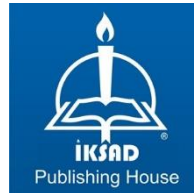
Nazife YİĞİT KAYHAN

Neslihan BAL

Pınar ARSLAN

Serap ÇETİNKAYA

Sumru ÇITAK



Copyright © 2021 by iksad publishing house
All rights reserved. No part of this publication may be reproduced,
distributed or transmitted in any form or by
any means, including photocopying, recording or other electronic or
mechanical methods, without the prior written permission of the publisher,
except in the case of
brief quotations embodied in critical reviews and certain other
noncommercial uses permitted by copyright law. Institution of Economic
Development and Social
Researches Publications®
(The Licence Number of Publisher: 2014/31220)
TURKEY TR: +90 342 606 06 75
USA: +1 631 685 0 853
E mail: iksadyayinevi@gmail.com
www.iksadyayinevi.com

It is responsibility of the author to abide by the publishing ethics rules.
Iksad Publications – 2021©

ISBN: 978-625-8061-27-7
Cover Design: İbrahim KAYA
August / 2021
Ankara / Turkey
Size = 16x24 c

CONTENTS

EDITED BY

PREFACE

Res. Assist. Dr. Meryem Burcu KÜLAHCI..... 1

CHAPTER 1

ORIJIN OF INFECTIOUS DISEASES AND COVID-19

Res. Asst. Dr. Betül AYDIN,
Prof. Dr. Leyla AÇIK 3

CHAPTER 2

GENETIC INTERPLAY BETWEEN THE DAIRY STREPTOCOCCUS THERMOPHILUS AND ITS PHAGES

Res. Ass. Dr. Serap ÇETİNKAYA
Prof. Dr. Ali Fazıl YENİDÜNYA 35

CHAPTER 3

CURRENT APPROACHES FOR THE DETECTION OF MRSA

Res. Assist. Dr. Meryem Burcu KÜLAHCI
Prof. Dr. Sumru ÇİTAK..... 63

CHAPTER 4

THE SHORT NOTES ON THE BIOLOGY OF HARVESTMEN (OPİLİONES, ARACHNIDA) AND TAXONOMIC APPROACHES TO TURKISH HARVESTMEN

Assist. Prof. Dr. İlkey ÇORAK ÖCAL
Prof. Dr. Nazife YİĞİT KAYHAN..... 81

CHAPTER 5

THE EXCRETORY SYSTEM OF ORTHOPTERA

Dr. Irmak POLAT.....101

CHAPTER 6

BETWEEN INTACT AND URBAN FRESHWATER: COMPARISON OF MORPHOMETRIC SCALE ON *HYDROCHARA CARABOIDES* (LINNAEUS, 1758) BY SUPPORT OF MOLECULAR IDENTIFICATION

Asst. Prof. Dr. Mehmet BEKTAŞ.....119

CHAPTER 7

THE APPLICATION AREAS OF FISH CELL CULTURES

Assist. Prof. Dr. Pınar ARSLAN.....139

CHAPTER 8

CHECKLIST OF TURKISH CRIOCERINAE (CHRYSOMELIDAE)

Dr. Neslihan BAL

Dr. Didem CORAL ŞAHİN.....153

PREFACE

Biological sciences aim at the study of life and living organisms, their life cycles, adaptations, and the environment. ‘Recent Advances In Biological Sciences’ describes recent progress in various biological sciences, such as microbiology, molecular biology, zoology, and botanic. This book consists of a total of eight chapters, each of which has been contributed by highly qualified professionals in the respective fields of research.

I am proud to present this book, which contains recently updated information on various research areas and techniques in the biological sciences, which will benefit many researchers from different life science institutions around the world.

We would like to thank Iksad Publishing house for their devoted work to bringing together valuable scientists, editing, and publishing the book named **Recent Advances In Biological Sciences**.

With my regards

Res. Assist. Dr. M. Burcu KÜLAHCI

CHAPTER 2

GENETIC INTERPLAY BETWEEN THE DAIRY *STREPTOCOCCUS THERMOPHILUS* AND ITS PHAGES

Res. Assist. Dr. Serap ÇETİNKAYA¹
Prof. Dr. Ali Fazıl YENİDÜNYA²

¹ Sivas Cumhuriyet University, Science Faculty, Department of Molecular Biology and Genetics, Sivas, Turkey.e-mail: serapcetinkaya2012@gmail.com
ORCID ID: 0000-0001-7372-1704

² Sivas Cumhuriyet University, Science Faculty, Department of Molecular Biology and Genetics, Sivas Cumhuriyet University, Sivas, Turkey.e-mail: alifazilyenidunya@gmail.com.ORCID ID: 0000-0002-9886-977X

INTRODUCTION

Streptococcus thermophilus has long been exploited as a milk clotting agent, starter, especially of yogurt manufacture, and recently, to a much lesser extent, in cheese production. This species has often been encountered in raw milk that constitutes its main natural source. It has generally been accepted that this species came to being very recently, as late as 30,000 years. Its genome has been considered at two levels of organization: the one includes genes indispensable for its survival, and the other, the remainder, may not be essential. Approaches employing computational prediction methods have evidenced that three main driving forces of evolution in prokaryotes, conjugation, competence, and transduction, have all played substantial roles in the shaping of its genome. These studies have also revealed 362 atypical genes of exogenous origin that could have been inserted into the genome of this new species through horizontal gene transfer (HGT) phenomena (Eng et al., 2011).

The production process of industrial yogurts involves the exploitation of two species of the lactic acid bacteria (LAB), *Lactobacillus delbrueckii* subsp. *bulgaricus*, and *Streptococcus thermophilus*. These starter species cooperate by reciprocating their specific needs during the fermentation process of milk into yogurt (Fig. 1), and they appear to owe these precious attributes to the mutual events of horizontal gene transfer (Liu et al., 2009).

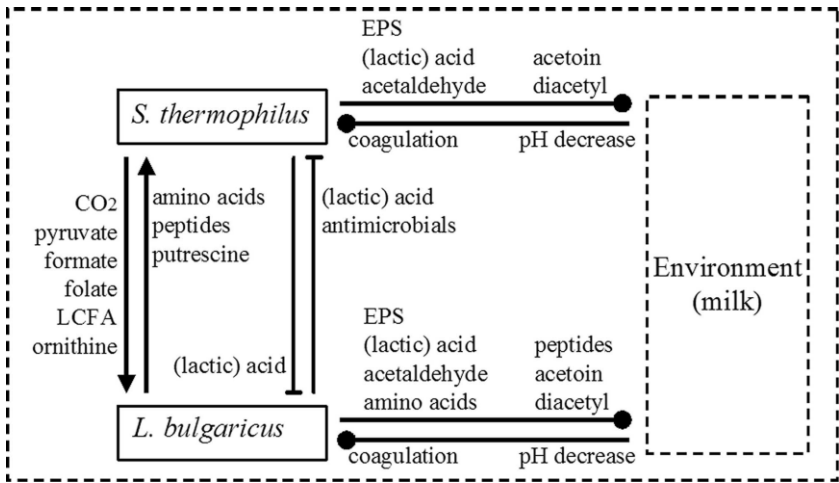


Figure 1. Schematic Illustration Of The Biochemical Interplay Taken Place Between The Two Yogurt Starters (Sieuwerts et al., 2008).

Genomes of *Lactobacillus delbrueckii* subsp. *bulgaricus* and *Streptococcus thermophilus* have been unraveled for some time now, and this information has been used to identify the genetic basis, established through the genomewide horizontal gene transfer (HGT) events, of the biochemical interplay. HGT involves the interchange of DNA segments of chromosomal- and/or episomal origin between interspecies prokaryotes. It serves as a means of cohabitation, which is largely made possible by diverse biochemical activities of distantly related species (Nicolas et al., 2007; Liu et al., 2009).

In silico efforts, comparing genomes of three *S. thermophilus* strains, LMG 18311, CNRZ1066, and LMD9, have provided insightful clues on the HGT events, through which sets of genes, *cbs-cblB(cglB)-cysE*, for example, had been inserted into *S. thermophilus* (Table 1). This gene cluster has been found to be involved in the metabolism of amino acids, cysteine, and methionine. Data produced have also suggested

that this species has evolved together with *Lb. delbrueckii* subsp. *bulgaricus* (Liu et al., 2009).

Cysteine biosynthesis commences with the conversion of L-serine to O-acetylserine by the product of *cysE* gene, serine acetyltransferase, and the products of *cglB* and *cbs* convert homocysteine to cysteine (Fig. 2). It has been implied that these genes had originally resided in *Lb. delbrueckii* subsp. *bulgaricus* as a shorter, truncated form and that it had been disabled in the context of cysteine and methionine production in this organism (Liu et al., 2009).

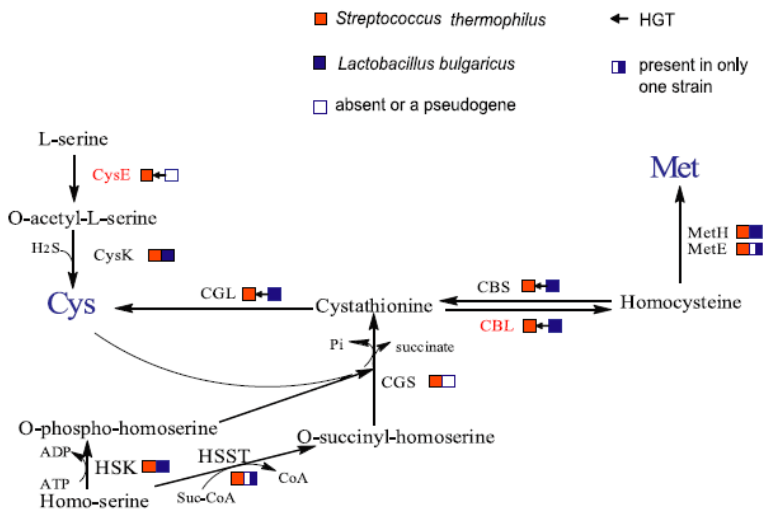


Figure 2: The Role Of HGT In The Synthesis Of Cysteine And Methionine In *S. thermophilus*.

Table 1: The Genes, *epsIM* and *epsIL*, Responsible For The Exopolysaccharide Synthesis Genes, On The Other Hand, Have Been Reported To Have Been Transferred From *S. thermophilus* Into *Lb. delbrueckii* subsp. *bulgaricus* And It Has Been Suggested That This Event Might Have Been Mediated Through Physical Contacts During Cocultivation Or In Yoghurt (Liu et al., 2009).

Gene cluster with	Gene ID(s) for strain:			GC content (%)	ξ Value (10 ³)	6 Plot position (%)	HGT mechanism-associated feature(s)	Function(s)
	LMG 18311	CNRZ1066	LMD9					
Low GC content								
S1	0098, 0099, 0100, 0102, 0103, 0108	0098, 0099, 0100, 0102, 0103	0131, 0133, 0134, 0135	30	64	75	Transposase, phage integrase	Antibiotic/bacteriocin biosynthesis protein or exporter, phage integrase, and hypothetical proteins
S2			0141, 0142, 0143, 0144, 0145	36	90	98	Transposase	ABC-type peptide transport system
S3			0146, 0148, 0149, 0150	36	63	75	Transposase	Bacteriocin exporter, EPS-related protein
S4	0182, 0183	0182; 0183		30	102	97		Transcriptional regulator, putative protein kinase
S5	0324, 0325, 0328	0324, 0325, 0328	1694	28	56	49	Transposase	ABC-type transporter, hypothetical protein
S6		0683, 0684, 0685, 0686, 0687, 0688, 0689, 0690		27	73	89	Transposase	Hypothetical proteins
S7	0706, 0707, 0709	0706, 0707, 0709		29	107	98	Phage	Hypothetical proteins
S8			0811, 0812, 0814, 0817	31	103	88	Transposase, phage	Hypothetical proteins
S9		0774, 0782		32	125	85	Phage	Hypothetical proteins
S10			1057, 1059, 1060, 1061, 1062, 1066	30	112	99.7	Transposase	Hypothetical protein, phage-associated proteins
S11	1041, 1042, 1043, 1044	1037, 1040, 1041, 1042, 1044		29	48	57	Transposase	UDP-N-acetylglucosamine enolpyruvyl transferase, regulator for MutR family, hypothetical protein, tyrosyl-tRNA synthetase
S12		1077, 1078, 1079, 1080, 1081, 1082		30	67	83	Transposase	EPS biosynthesis
S13	1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1102			30	84	99	Transposase	EPS biosynthesis
S14			1296, 1297, 1298, 1299, 1300, 1301	27	94	98		Macrolide efflux protein, peptidase F, regulator for MutR family, hydrolase, hypothetical proteins
S15			1328, 1329	29	68	30		UDP-N-acetylglucosamine 2-epimerase, hypothetical protein
S16	1393	1393	1351, 1352, 1355, 1356, 1358	30	71	90	Transposase	Multidrug efflux protein, regulator for MutR family, hypothetical proteins
S17		1479, 1480	1441, 1442, 1443	30	48	46		Glycosyltransferase involved in cell wall biogenesis and transcriptional activator <i>zmrA</i>
S18	1481, 1484, 1486		1445	31	69	78		Hypothetical membrane proteins
S19			1474, 1475, 1476, 1477	31	66	89		CRISPR system-related proteins
S20	1512, 1514	1512, 1514		29	112	94		Hypothetical proteins
S21			1693, 1698	30	64	51	Transposase	Regulator for Xre family, abortive infection phage resistance protein
S22		1943, 1944	1915, 1916	27	89	87	Transposase	Bacteriocin-related proteins
S23	1947, 1948, 1949, 1950, 1951	1947, 1948, 1949, 1950, 1951	1919, 1920, 1921, 1922, 1924	28	88	99	Transposase	Regulator for MutR family and ABC transporter, putative protein kinase, hypothetical protein
S24	1976, 1977, 1978, 1983, 1989	1976, 1977, 1978, 1983, 1989	1955, 1955, 1960, 1966	29	70	49	tRNA	Conserved hypothetical proteins
High GC content								
S25	0040, 0041	0040, 0041	0058, 0059	49	75	67	Transposase	Purine metabolism
S26	0846, 0847, 0848	0846, 0847, 0848	0885, 0886, 0887	43	148	99.4	Transposase	Cys/Met metabolism
S27			1200, 1201	46	00	40	Transposase	Histidine synthesis
S28	1680, 1685	1685		48	161	83	Transposase	Putative bacteriocin

1. PHAGE GROUPS OF *STREPTOCOCCUS THERMOPHILUS*

Infection of a bacterium starts with phage adsorption on the surface of the host that necessitates the presence of a specific receptor and a phage ligand, sometimes called “anti-receptor”. As in most of the other topics of molecular biology, insight gained in this area has been derived from studies on the infection of *E. coli* with its specific phages (Goldberg et al., 1994). Infections with T4 phage for example is largely mediated by the protein of *orf37* gene, gp37 (Wood et al., 1994). This protein constitutes the large subunit of the distal part of the T4 tail and performs the act of an anti-receptor via its C-terminus in a wide host range. Three of its known receptors are B lipopolysaccharide, OmpC, and OmpF (Te’art et al., 1998). The phage λ anti-receptor, protein J, also interacts with its receptor through its carboxy-terminus. These two phage proteins, thus, appear to be the main determinants of the host specificity (Duplessis and Moineau, 2001).

Mostly *Siphoviridae* family of phages have been isolated from *S. thermophilus* cultures and they have been divided according to the ends and the packaging mode of their genome into two groups, cohesive or headful (*cos* and *pac*, respectively), (Le Marrec et al., 1997) (Fig. 3). Later on, a third group, known as 5093-like phages, have been included (Mills et al., 2011; Mahony et al., 2014). As could be seen below, so far, the number of groups increased to five.

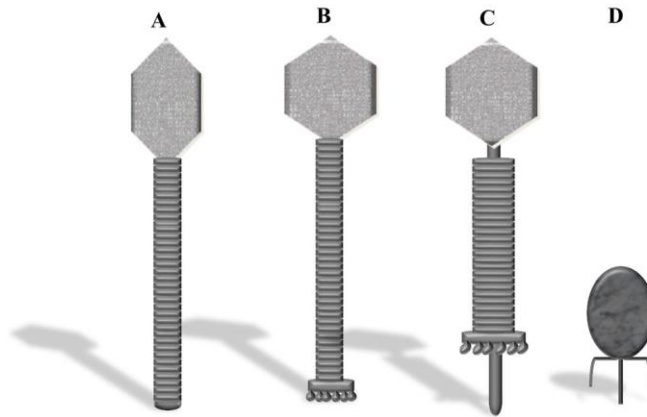


Figure 3: Morphotypes of Common LAB Phages. A: *Siphoviridae* (With Prolate-Head). B: *Siphoviridae* (Isometric-Head). C: *Myoviridae* Phages (With Long Contractile Tail). D: *Podoviridae* (With Short Non-Contractile Tails) (Mahony et al., 2014).

The first group, *cos*, has two major structural proteins (MSPs of 27 and 32 kDa). The latter, packaging, group has been characterized with three MSPs, having molecular weights of 15, 25, and 43 kDa). Computational analyses of the seven phage genomes have suggested that the ordering of the phage genes had a modular structure and that their evolution has followed a modular course (Figs. 4 and 5) (Duplessis and Moineau, 2001).

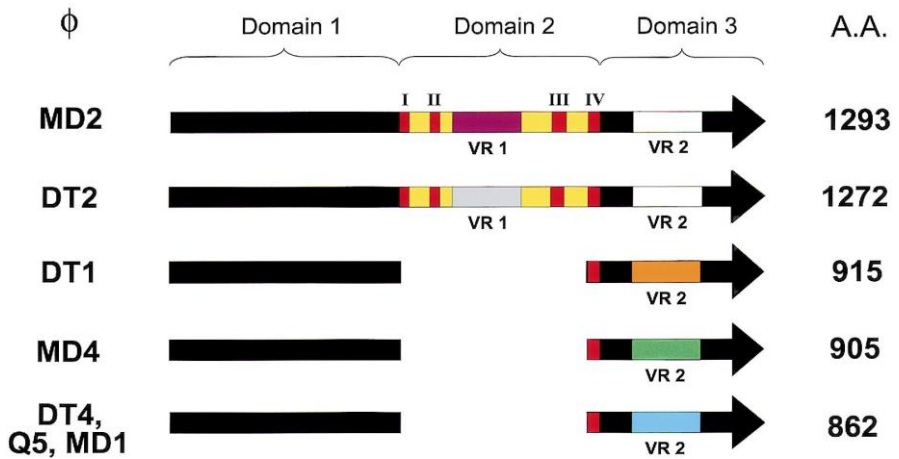


Figure 4: The Organisation Seven ORF18s. VR1, VR2: Variable Regions. Motifs I, II, III and IV: Collagen-Like Repeats.

One of the well-characterized *S. thermophilus* phages, DT1, consists of an isometric head, 60nm in diameter, and a 260nm long, non-contractile tail with 8 nm diameter. Its genome is 34 820 bp linear DNA with cohesive ends. It has two major structural proteins with molecular masses of 26 and 32 kDa. The genome is poor in guanine and cytosine, approximately 39%. So far 46 open reading frames (ORFs) have been mapped, and 20 of these putative functions have been allotted. The protein encoded by *orf18* could be acting as the anti-receptor (Tremblay and Moineau, 1999) because the weight and location of its gene appear to be the same as the gpJ and J gene in Lambda phage. The two proteins also have the same isoelectric (pI) points. Some evolutionary features of *orf18* also has resemblances to those of the other phages in terms of the distribution of conserved regions (Te' tart et al., 1996; 1998; Lucchini et al., 2000). Furthermore, ORF18 of DT1 has similar amino acid composition at its N-terminus to those of seven other phages, including DT4, MD1,

MD2, and Q5, in which coding sequences for collagen-like repeats has been mapped. The carboxy-terminal region of ORF18 also included collagen-like repeats and a variable region (VR2, 145 amino acids) (Duplessis and Moineau, 2001).

Genomic sequencing studies and following computational analyses have shown that the genome of an *S. thermophilus* phage is organised into four large modules: (1) containing genes responsible for the packaging of DNA and tail genes, with *cos* configuration (Sfi21 type) or with *pac* configuration (Sfi11 type) (Lucchini et al., 1999); (2) spanning structural tail genes, and the genes of lysis and lysogeny; (3) often a Sfi21-type replication module, divided into two different gene clusters (Desiere et al., 1997), and (4) a 5kb long module, constituting the 3'-end of the genome (Bru'ssow and Desiere, 2001).

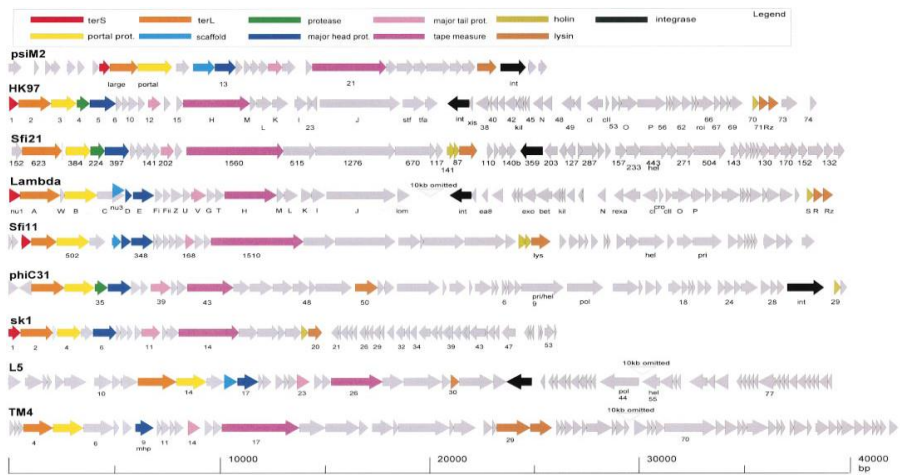


Figure 5: Alignment of The *Siphoviridae* Genomes (Bru'ssow and Desiere, 2001).

In 2016, a third phage type, forming the group 987 with four members, has been reported. The members appeared to have been the products of hybrid genomes of those phages (Fig. 6.) that have been shown to be able to adsorb onto dairy strains of *S. thermophilus* as well as *Lactococcus lactis*. Thus this discovery has added another dimension to the vulnerability of dairy industries regarding the capability of infectious agents and to the possibilities of countermeasures that should be taken to challenge these devious entities (McDonnell et al., 2016).

Hybrid genomes of the 987 group seemed to have been dependent, within the confines of the dairy industry, on horizontal gene transfer cases, involving the replication- and structural modules of *S. thermophilus* and *L. lactis*, respectively. This group has been morphologically related to those of the *L. lactis* phages. This could be expected but one other striking feature of the new group has been that the genomes of 987 group harbored significant divergence from within, as opposed to the previous data obtained from other groups of the *S. thermophilus* phages. The highly mosaic and diverse nature of the novel hybrid genomes calls to mind both the production of bacteriophage-insensitive mutant (BIM) strains of *S. thermophilus* and the implementation of related rotation programs to alleviate the problem of inadvertent hybrid phage damage in fermentation plants (McDonnell et al., 2016).

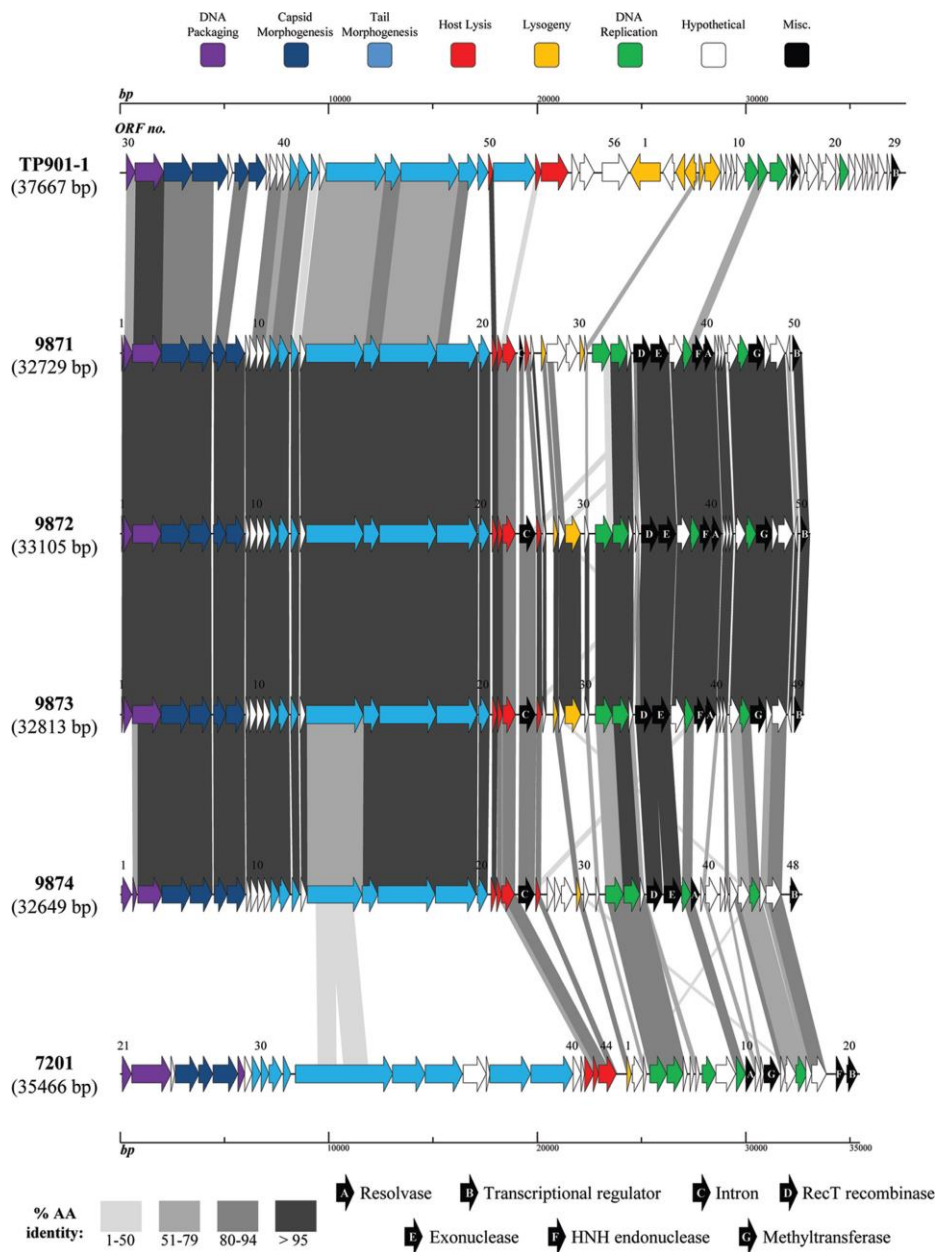


Figure 6: Genomic Organization of Four 987 Phages With Respect To P335 And P7201 (McDonnell et al., 2016).

Arrows: predicted ORFs (their assignments have been indicated with the colored boxes, above). Gene products have been indicated with grey and dark shades (McDonnell et al., 2016).

A fourth type phage assigned for *S. thermophilus* has been 5093, found in a cheese starter, CSK939. Its genome contained 37,184 bp DNA, with a rather dissimilar sequence composition to those of either *cos* or *pac* group. Surprisingly, however, it has shown a significant similarity to the genomes of other streptococci, suggesting that this phage could have a rather large streptococcal host range and that it has experienced substantial interspecies DNA exchange phenomena by HGT or recombination mechanisms (Mills et al., 2011).

2. PHAGE GENOMIC DIVERSITY

Cos group contains the most comprehensively investigated infectious entities and it has so far been the most recurrent and most diverse group in the dairy industry (Fig. 7). These concordant findings could imply that they hold the longest evolutionary history among the *S. thermophilus* phages. It appears, on the other hand, that such a high diversity in nucleotide sequence has not changed the ordering of the genes (Lavelle et al., 2018).

Pac group also allows a highly significant sequence diversity among its isolated members (Fig. 7). One extremely important feature of this group was that the nucleotide sequence encoding the “the anti-receptor” device displayed very high percentages of dissimilarity. Similarly, gene clusters forming both the modules of lysogeny and

replication seem to have been highly diverged. These findings have also been in concordance with the rather wide host range of the *pac* phages (Lavelle et al., 2018).

Hybrid phage genomes, of 5093 and 987, appear to display lesser diversity from within than those of either *cos* or *pac* phages (Fig. 7). This could be accounted for by the fact that the hybrid phages are much newer entities with respect to the other groups. Nucleotide comparison studies have also revealed that hybrid phages divergence had been generated by the small insertion and deletions (indels) rather than shuffling of the large DNA fragments (Lavelle et al., 2018).

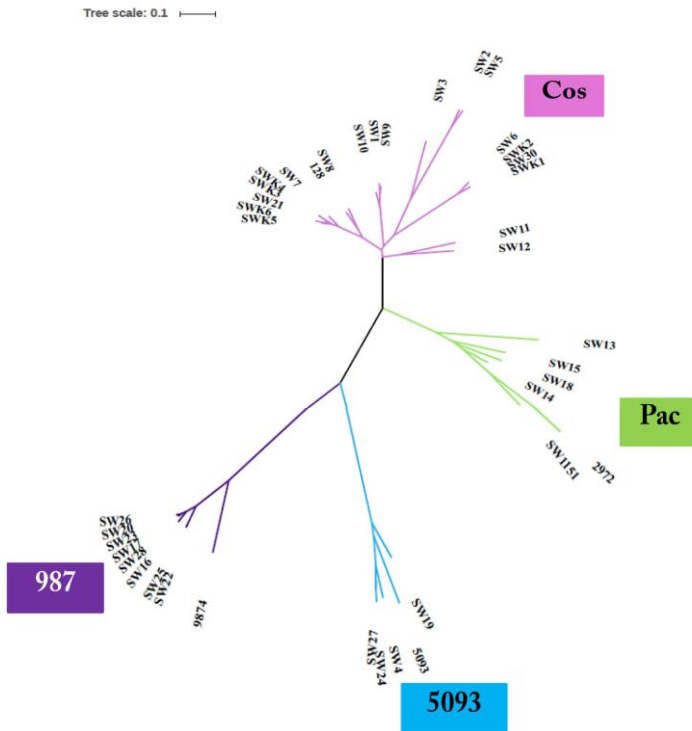


Figure 7: Genomic Diversity of *S. thermophilus* Phage Groups (Lavelle et al., 2018).

Proteomic data, built in a phylogenetic tree (Fig. 8) at first glance seems to differentiate *cos* group into a single phylogenetic entity and that the three of the remaining four groups were evolutionarily closer to the *cos* proteome than that of the *pac* group (Philippe et al., 2020).

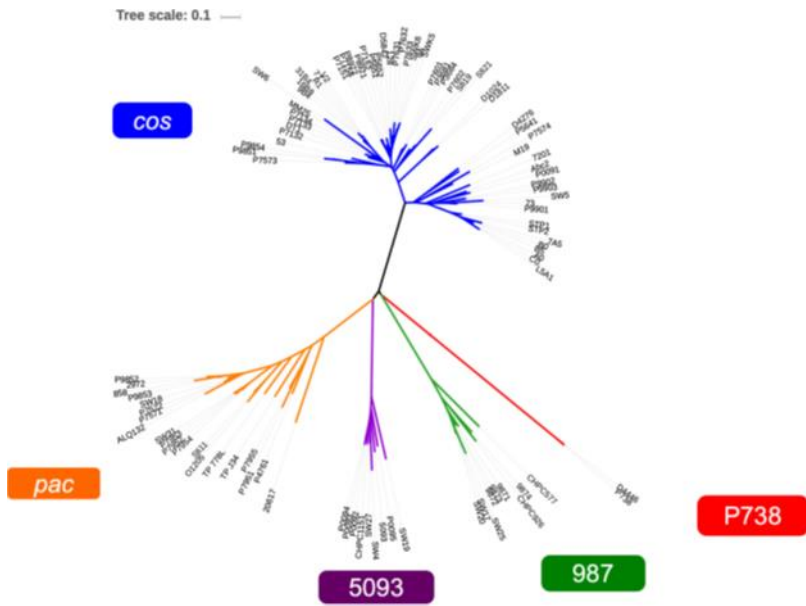


Figure 8: Phylogenetic tree reflecting the proteomic data.

Amino acid comparison studies on the carbohydrate-binding domain of receptor-binding proteins (RBPs) have suggested that these host-specifying devices have evolved independently from the remaining genomic modules in a highly diverse range of phages (Fig. 9). This recalls the possibility to mind that phage modules are not necessarily to have co-evolved. The “independent” evolution could be driven by the gene shuffling mechanism. Hence, phages seem to obtain carbohydrate-binding modules in order to be able to diversify their

host range. Here, the members of *Brussowvirus* and *Moineauvirus* (BVs and MVs, Fig. 10) appear to have served as good donors for the genes of RBP device (Hanemaaijer et al., 2021).

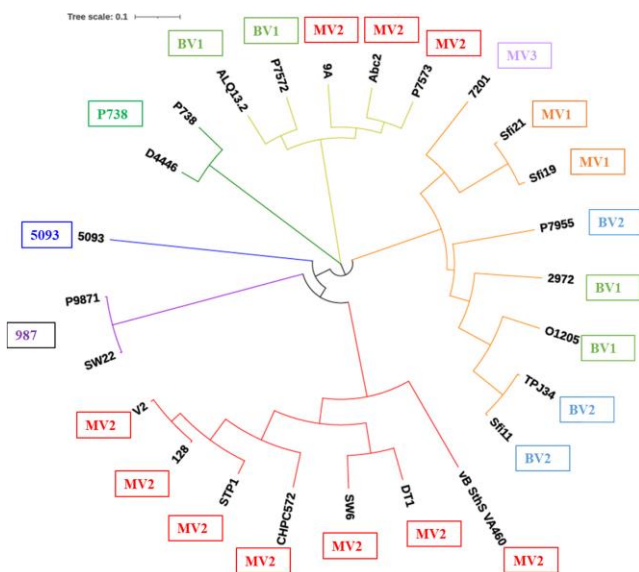
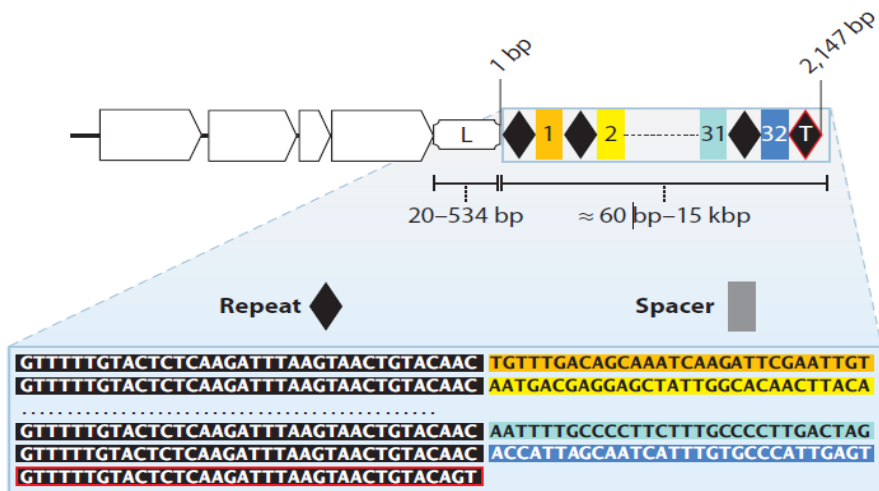


Figure 9: Phylogenetic Tree of Partial RBP Amino Acid Sequence Involved In Carbohydrate Binding.

3. CLUSTERED REGULARLY INTERSPACED SHORT PALINDROMIC REPEATS, CRISPR, OF *S. THERMOPHILUS*

Genome projects have mainly aimed at deciphering the genes and their annotations. Later on, it has become clear that spacer DNA residing between the genes loci has been coding functional molecules, other than proteins, named noncoding RNA (ncRNA). One of these chromosomal elements, having the widest distribution and a very diverse loci organization, has been identified in prokaryotes in 1987 and called clustered regularly interspaced short palindromic repeat CRISPR (Ishino et al., 1987; Deveau et al., 2010).

A CRISPR locus is devoid of open reading frames and includes a fixed range, between 2 and 375, of direct repeats with lengths between 21 and 48 bp. The repeats are interrupted by non-repeating spacers, ranging from 26 to 72 bp (Fig. 10). Approximately one-third of the repeats appear to have been shortened. The final repeat at the rightmost end has often been found to be less preserved with respect to the others. The locus is flanked by an A+T rich leader sequence and a promoter at its upstream end. The CRISPR locus is further specified with some functionally related, 4 to 20 genes within its neighborhood, located up- or downstream, that are named *cas* (CRISPR-associated genes). The genes encode for a series of Cas proteins which form Cas endonucleases. These two entities build together a CRISPR/Cas system. As many as 20 and diverse CRISPRs, making up approximately 1% of the genome and can exist as different loci along the prokaryote chromosome. They can also be mapped in plasmid DNA (Deveau et al., 2010).



General features

Repeats

- 2 to 375 per locus
- Mostly invariable sequence
- 21 to 48 bp

Spacers

- 1 to 374 per locus
- Variable sequence
- 26 to 72 bp

Figure 10: Physical Constitution Of A CRISPR Unit.

CRISPR/Cas loci may constitute a substantial part of the prokaryote immune system against horizontal DNA transfer affected by phage infections and plasmid transformations. This protective system seems to operate via RNA-interference of protein translation (Fig. 11). Palindromic nature of CRISPR enables its transcripts to assume highly firm stem-loop structures, as evidenced for other functional RNA species (Deveau et al., 2010).

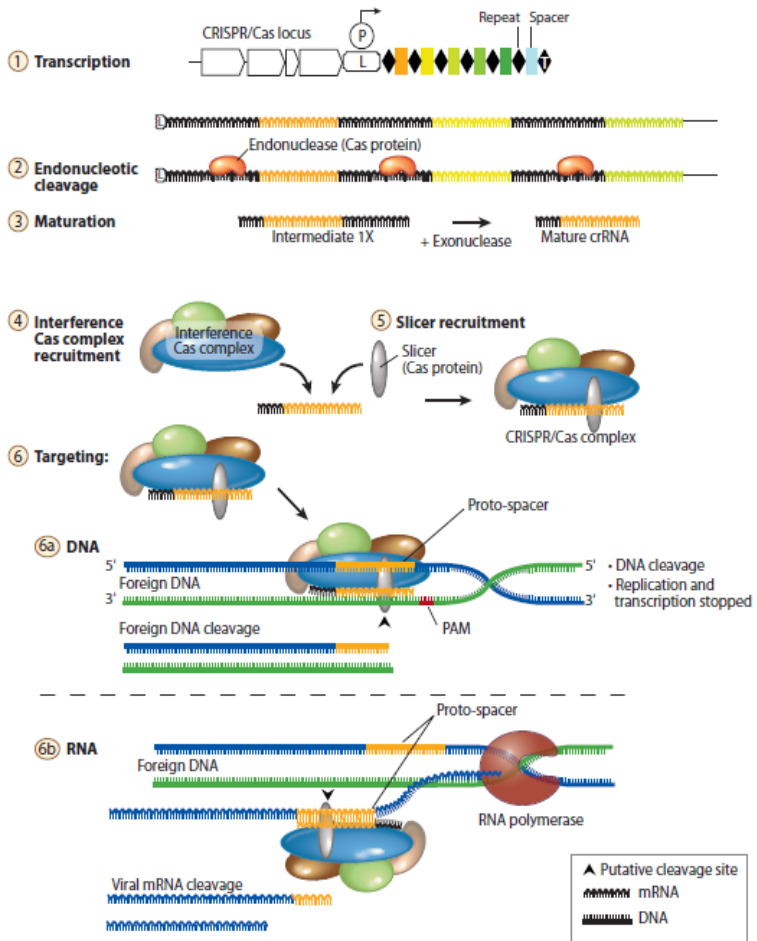


Figure 11: Interference of Translation Through CRISPR RNA.

Unraveling of CRISPR/Cas nucleotide structure and function has prompted some intensive research on *S. thermophilus* to identify or generate bacteriophage-insensitive strains or mutants (BIMs). It has been expected that a “natural”, adaptive, immune strain should have experienced phage infections before its isolation. And it has been evidenced that phage resistance could be made possible by the addition of one single repeat 5' to the CRISPR loci in *S. thermophilus*.

It turns out that a resistant bacterial strain can be infected by a mutant phage. These two findings set a scenario where an interplay might be taking place between the host CRISPRs and phage genome (Fig. 12) (Deveau et al., 2010).

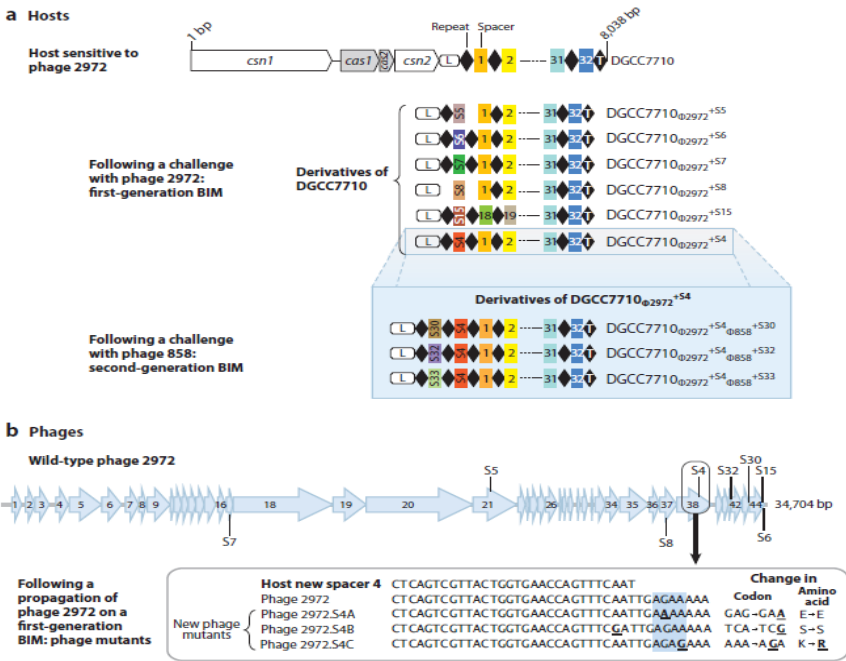


Figure 12: CRISPR Can Mediate A Genetic Interplay Between Dairy *S. Thermophilus* and Its Phages.

Cas1 and Cas2 are expressed in cells harboring CRISPR loci and their abundance appears to be an indicator for the resistance activity of *S. thermophilus* LMD-9 (He et al. 2013; Goh et al. 2011). On the basis of the types of Cas proteins produced, the CRISPR/Cas systems are organized into three subtypes. The presence of Cas3, Cas9, and Cas10, specify the three subtypes I, II, and III, respectively, and they are these are the most frequently found subtypes in *S. thermophilus*. Of the 27

isolates of *S. thermophilus*, more than 96% contained CRISPR/Cas loci (Hu et al., 2020).

Genomic sequencing studies have implied that CRISPR1 (Fig. 13) could be the oldest CRISPR as it has been mapped in 78% of *S. thermophilus* studied and it harboured the highest number of direct repeats (DRs) (Hu et al., 2020).

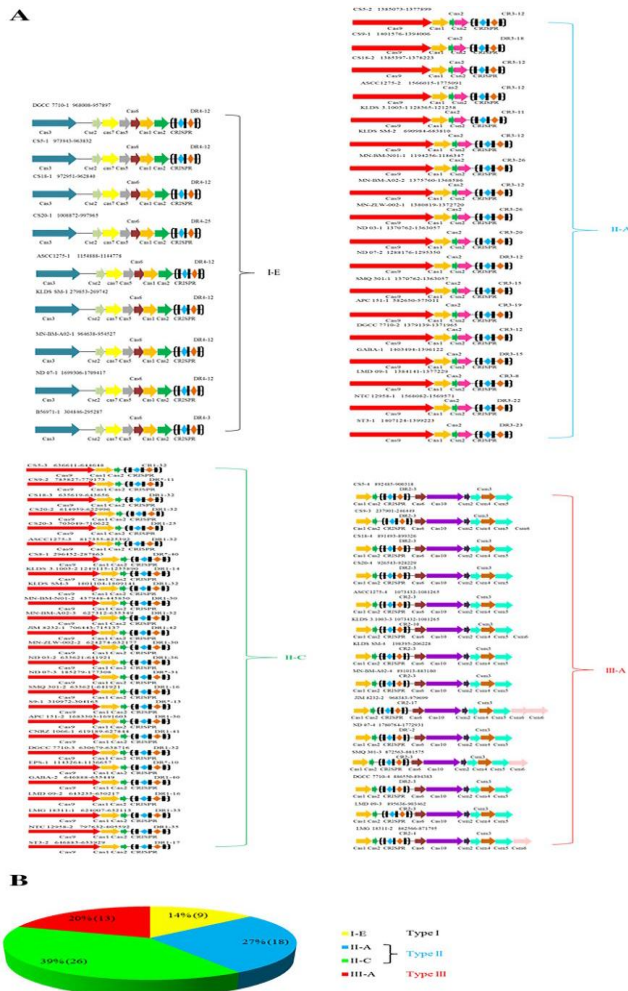


Figure 13: CRISPR Diversity In *S. Thermophilus*.

Seven direct repeats have been mapped in *S. thermophilus* and four of them were most frequently encountered (DR1, DR2, DR3, and DR4), and the remaining three with much fewer frequencies (Fig. 14) (Hu et al., 2020).

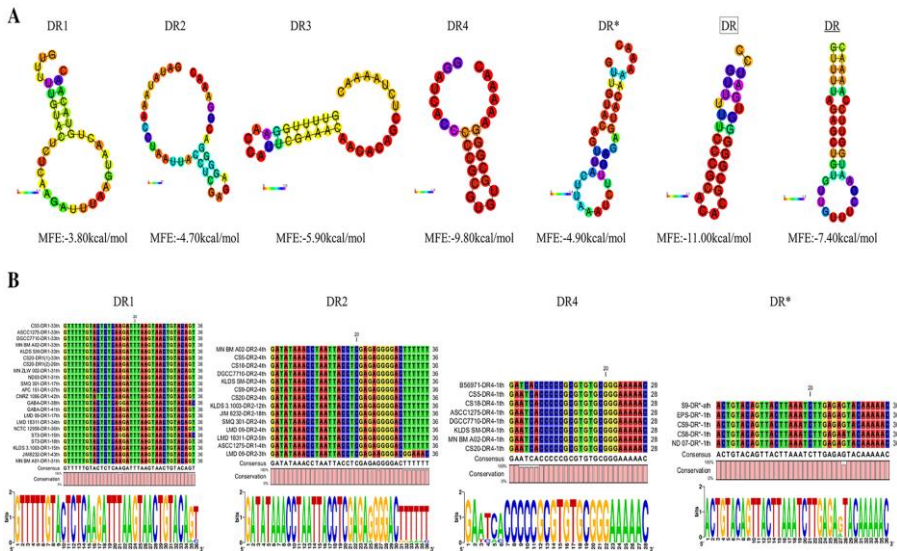


Figure 14: Minimum Free Energy, MFE, Based Secondary Structures of *S.thermophilus* CRISPR RNA.

In the strains of *S. thermophilus*, CNRZ1066, JIM8232, and KLDS 3.1003, the number of spacers differed but their length remained rather similar, between-33 and 35 bp. Again CRISPR1 also appeared to possess the highest number of spacers, while their number was similar in CRISPR3 and CRISPR4 and much lesser in CRISPR2.

Similarity search between CRISPR spacers and available database sequences has revealed that a spacer DNA could be homologous to that of the several *S. thermophilus* phages. The CRISPR-Cas system interferes with phage infections through cutting the phage DNA: upon

invasion by a phage, small pieces of phage DNA are inserted into the host genome as CRISPR spacers. These new spacers could be detected in CRISPR1 and CRISPR3. Then follows transcription of the CRISPR locus and the single-stranded crRNA is produced. This RNA molecule complexes with Cas through its secondary structure, and forms CRISPR nucleoprotein complex (crRNP). The crRNP assumes the role of an endonuclease and is guided by its crRNA to specifically cleave invading phage DNA (Hao et al., 2018).

CONCLUSION

The chapter was prepared with the intention to provide a concise information on the genetics of dairy *S. thermophilus* in relation to its phages. The text was extricated from key references with relevant Figures. In essence, it was tried to make a collection of the key findings on the subject and to reemphasize them together.

It appears that the starter performance of dairy *S. thermophilus* is indispensably dependent on the presence of *Lactobacillus delbrueckii* subsp. *bulgaricus* in the making of yogurt. Evolutionary studies have indicated that the basis of such genetic acquirements is the horizontal gene transfer. Five groups of *S. thermophilus* phages have been established. A *cos* phage, DT1, poses to be the oldest and widest infective agent for dairy *S. thermophilus*. An anti-receptor phage protein, ORF18, has been suggested on the basis of comparative genomic sequence analyses. Such studies have also shed a substantial amount of light as to the physical structures of the phages of dairy *S. thermophilus*. The phage genomes have been found to show

modularity in functional as well as evolutionary senses. Later phage groups seem to possess hybrid genomes that have been established within the confines of dairy industry and involved the infection of both *S. thermophilus* and *Lactococcus lactis*. *Cos* phages form the most diverse and widest group of infectious entities. Nucleotide data have indicated that *cos* and *pac* groups are closer to one another than the other three groups. In the proteomic comparison, on the other hand, *cos* forms one distinct entity, and the remaining four seem to be clustered together in the opposite direction. An even more striking finding has been that the receptor-binding module appeared to have been independent of the remaining three genomic modules in its evolution. Details of the physical features of *S. thermophilus* CRISPR were also reemphasized and text was reinforced with relevant Figures. Here it would be worth reinstating that immune dairy *S. thermophilus* strains could be reinfected with a mutant phage. Three CRISPR subtypes have been suggested for dairy *S. thermophilus* and CRISPR1 appeared to be the oldest. Some secondary structures for CRISPR RNA presented have been generated on the basis of minimum free energy. A schematic representation was also included to show how the CRISPR RNA interfere, through its secondary structure, with the function of translational machinery.

REFERENCES

- Brußow, H., and F. Desiere. (2001). Comparative phage genomics and the evolution of Siphoviridae: insights from dairy phages, *Mol. Microbiol.*, 39, 213–223.
- Desiere, F., Lucchini, S., Bruttin, A., Zwahlen, M.-C., and Brußow, H. (1997). A highly conserved DNA replication module from *Streptococcus thermophilus* phages is similar in sequence and topology to a module from *Lactococcus lactis* phages, *Virology*, 234, 372–382.
- Deveau, H., Garneau, J.E., and Moineau, S. (2010). CRISPR/Cas system and its role in phage-bacteria interactions, *Annu. Rev. Microbiol.*, 64, 475–493.
- Duplessis, M. and S. Moineau. (2001). Identification of a genetic determinant responsible for host specificity in *Streptococcus thermophilus* bacteriophages, *Mol. Microbiol.*, 41, 325–336.
- Eng, C., Thibessard, A., Danielsen, M., Rasmussen, T.B., Mari, J.F., Leblond, P. (2011). In silico prediction of horizontal gene transfer in *Streptococcus thermophilus*, *Arch. Microbiol.*, 193, 287–297.
- Goldberg, E., Grinius, L., and Letellier, L. (1994). Recognition attachment and injection. In *Molecular Biology of Bacteriophage T4*, Karam, J.D. (ed.). Washington, DC: American Society for Microbiology Press, 347 – 356.
- Hanemaaijer, L., Kelleher, P., Neve, H., Franz, C. M. A. P., de Waal, P.P., van Peij, N. N. M. E., van Sinderen, D., Mahony, J. (2021). Biodiversity of Phages Infecting the Dairy Bacterium *Streptococcus thermophilus*, *Microorganisms*, 9, 1822.
- Hao, M., Cui, Y., Qu, X., (2018). Analysis of CRISPR-Cas system in *Streptococcus thermophilus* and its application, *Front. Microbiol.*, 9, 257.
- Hu, T., Cui, Y., and Qu, X. (2020). Characterization and comparison of CRISPR Loci in *Streptococcus thermophilus*, *Arch. Microbiol.*, 202, 695–710.
- Ishino, Y., Shinagawa, H., Makino, K., Amemura, M., Nakata, A. (1987). Nucleotide sequence of the *iap* gene, responsible for alkaline phosphatase

- isozyme conversion in *Escherichia coli*, and identification of the gene product, *J. Bacteriol.*, 169, 5429–33.
- Lavelle, K., Martinez, I., Neve, H., Lugli, G., Franz, C., Ventura, M., et al. (2018). Biodiversity of *Streptococcus thermophilus* Phages in Global Dairy Fermentations, *Viruses*, 10, 57730.
- Le Marrec, C., van Sinderen, D., Walsh, L., Stanley, E., Vlegels, E., Moineau, S., Heinze, P., Fitzgerald, G., Fayard, B. (1997). Two groups of bacteriophages infecting *Streptococcus thermophilus* can be distinguished on the basis of mode of packaging and genetic determinants for major structural proteins, *Appl. Environ. Microbiol.*, 63, 3246-3253.
- Liu, M., Siezen, R. J., Nauta, A. (2009). In silico prediction of horizontal gene transfer events in *Lactobacillus bulgaricus* and *Streptococcus thermophilus* reveals protocoeoperation in yogurt manufacturing, *Appl. Environ. Microbiol.*, 75, 4120–9.
- Lucchini, S., Desiere, F., and BruÈssow, H. (1999). Comparative genomics of *Streptococcus thermophilus* phage species supports a modular evolution theory, *J. Virol.*, 73, 8647-8656.
- Lucchini, S., Sidoti, J., and BruÈssow, H. (2000). Broad-range bacteriophage resistance in *Streptococcus thermophilus* by insertional mutagenesis, *Virology*, 275, 267–277.
- Mahony, J., Bottacini, F., van Sinderen, D., Fitzgerald, G. F. (2014). Progress in lactic acid bacterial phage research, *Microb. Cell. Fact.*, 13, S1.
- McDonnell, B., Mahonym, J., Neve, H., Hanemaaijer, L., Noben, J.P., Kouwen, T., van Sinderena, D. (2016). Identification and analysis of a novel group of bacteriophages infecting the lactic acid bacterium *Streptococcus thermophilus*, *Appl. Environ. Microbiol.*, 82, 5153-5165.
- Mills, S., Griffin, C., O’Sullivan, O., Coffey, A., McAuliffe, O. E., Meijer, W. C., Serrano, L. M., Ross, R. P. (2011). A new phage on the ‘Mozzarella’ block: Bacteriophage 5093 shares a low level of homology with other *Streptococcus thermophilus* phages, *Int. Dairy J.*, 21, 963-969.

- Nicolas, P., Bessieres, P., Ehrlich, S. D., Maguin, E., van de Guchte, M. (2007). Extensive horizontal transfer of core genome genes between two *Lactobacillus* species found in the gastrointestinal tract, *BMC Evol. Biol.*, 7, 141.
- Philippe, C., Levesque, S., Dion, M. B., Tremblay, D. M., Horvath, P., Lüth, N., et al. (2020). Novel genus of phages infecting *Streptococcus thermophilus*: genomic and morphological characterization, *Appl. Environ. Microbiol.*, 86, 1–40.
- Sieuwerths, S., de Bok, F. A., Hugenholtz, J., van Hylckama Vlieg, J. E. (2008). Unraveling microbial interactions in food fermentations: from classical to genomics approaches, *Appl. Environ. Microbiol.*, 74, 4997–5007.
- Te' tart, F., Repolla, F., Monod, C., and Krisch, H.M. (1996). Bacteriophage T4 host range is expanded by duplication of a small domain of the tail fiber adhesin, *J. Mol. Biol.*, 258, 726–731.
- Te' tart, F., Desplats, C., and Krisch, H.M. (1998). Genome plasticity in the distal tail fiber locus of the T-even bacteriophage: recombination between conserved motifs swaps adhesin specificity, *J. Mol. Biol.*, 282, 543 – 556.
- Tremblay, D.M., and Moineau, S. (1999). Complete genomic sequence of the lytic bacteriophage DT1 of *Streptococcus thermophilus*, *Virology*, 255, 63–76.
- Wood, W.B., Eiserling, F.A., and Crowther, R.A. (1994). Long tail fibers: genes, proteins, structure and assembly. In *Molecular Biology of Bacteriophage T4*, Karam, J.D. (ed.). Washington, DC: American Society for Microbiology Press, 347 – 356.



IKSAD
Publishing House




ISBN: 978-625-8061-27-7

16 Eylül 2021

İlgili Makama,

İksad Yayınevi 2014 yılından itibaren uluslararası düzeyde düzenli olarak faaliyet yürütmektedir. Yayınladığımız kitaplar Türkiye ve birçok ülkede yükseköğretim kurumlarında dijital ve fiziksel ortamda kataloglanmaktadır. **Üniversitelerarası Kurul Başkanlığı'nın 19.11.2019 tarihli** tanımına göre "Tanınmış Uluslararası Yayınevi" kategorisinde yer almaktadır.

Bilgilerinize arz ederim.


Selma Sağın **BİRDİRİCİ**
Yayın Grup Başkanı

Üniversitelerarası Kurul Başkanlığı
T.C. Kültür ve Turizm Bakanlığı
Resmî Gazete No: 2019/23422
www.ikad.org.tr

1-SOSYAL, BEŞERİ VE İDARİ BİLİMLER ALANINDA YAYINLANAN BAZI KİTAPLARIMIZ			
	ISBN	ESER ADI	YAZAR- EDİTÖR
1	978-625-7954-23-5	The Current Approaches In Tourism	Editör Alper Ateş, Kadriye Alev Akmeşe
2	978-625-7954-09-9	Political And Institutional Reviews On Social Studies	Editör Assoc. Prof. Cengiz Aytun, Assoc Prof. Cemil Serhat Akın
3	978-625-7954-01-3	Current Issues İn Business	Editör Prof. Dr. Sadettin Paksoy, Mustafa Latif Emek
4	978-625-7029-87-2	Tax Compliance And Reasons For Taxation Behaviors And Tax Peace In Turkey	Hacı Muhammet Kekeç
5	978-625-7029-90-2	Azerbaycanın Kültürel Gelişimi	Sehrana Kasimi
6	978-625-7029-93-3	European Union’s Integrated Educational Policy Background And Involved Political Institutions	Soner Akın
7	978-625-7029-78-0	Academic Research İn Social Sciences And Humanities	Editör Dr. Özlem Kaya
8	978-625-7029-60-5	The Basic Studies On Economics And Business	Editör Prof. Dr. Sadettin Paksoy, Prof. Dr. Mehmet Kara
9	978-625-7029-54-4	Main Themes İn Tourism	Editör Kadriye Alev Akmeşe
10	978-605-7695-58-1	Beyond Budgeting: Examination Of Applicability And Potential Impacts In Turkey	Gülçin Yıldırım
11	978-605-7695-95-6	New Horizons In Communication Age	Editör Dr. Birgül Alıcı, Dr. Ömer Aydınlioğlu
12	978-605-7695-77-2	Discussions Between Economic Agents: Time Series Analysis İn Social Sciences	Editör Okyay Ucan
13	978-605-7695-75-8	Studies On Social Sciences	Editör Dr. Özlem Kaya
14	978-605-7923-72-1	Studies On Economic Development	Editör Assoc Prof. Cemil Serhat AKIN, Assoc. Prof. Cengiz AYTUN
15	978-605-68667-6-0	Tarihi Sana	Üsenbek Rahmet,Kojakeeva L.T, Jilkışbaeva K.K,Ahmetova J.vd
16	978-605-9885-60-7	Contemporary World Policy, Politics And International Relations	Editör Rahmat Ullah,Editör Sabbır Hasan
17	978-605-7695-26-0	Current Issues And Humanity Sciences	Editör Doç. Dr. Gökhan Ofloğlu
18	978-605-7875-64-8	Beynəlxalq Münasibətlərin Proqnozlaşdırılması	Prof. Dr. Gülzar İbrahimova
19	978-605-68667-0-8	Білім Беру Жүйесі Зерттеулері: Қазақстан	Medeuova G. J.,Rahimova Z. S.,Kurasbaeva A. J. Koylbaev J.vd
20	978-605-68667-2-2	Педагогикалық Білім Зерттеулері: Қазақстан	Sadıkova Dinura,Adilhan Mariyaş,Beysembaeva K.D., Karimova R.E.,vd
21	978-605-68667-4-6	Заманауи Ақпараттық Қоғам Және Әлеуметтік Ой	Kurmanova Saltanat,Kıyakbaeva U.K., Bekbenbetova K.A, vd
22	978-605-68667-3-9	Семья И Общество Тюркских Народов Евразии	Oksana Sorokina,Asilguzhin Rafil,Puşkina Klara, Nina Kindikova,vd
23	978-605-68667-1-5	Кәсіптік Білім Беру Жүйесі: Қазақстан	Kırbasova E. A.,Dyuskalievа G.U., Kenesbaev S.M.,vd
24	978-605-68528-7-9	Экология Зерттеулері: Қазақстан	Медеуова Ғалия,Садыкова Дамежан, Жайлыбай К.Н.,vd
25	978-605-68667-5-3	Қазақстандағы Ұлттық Білім	Kanat Bazarbaev, Üsenbek Rahmet, Serjankızı Jansaya, vd,
26	978-605-68667-7-7	Подготовка Будущих Педагогов В Казахстане	Presnova Lyudmila,Jumahmetova Z.J., Abaeva G.A, Ospanova B.A, vd
27	978-605-7510-01-3	Исследования Тюркской Народной Культуры	Monguş E.D.,Ayıcı E.B., Asilguzhin Rafil,Yusupov Gaziz,vd
28	978-605-7510-02-0	Қазақстанда Туризмнің Дамуы	Sadıkova Damejan, Mustafa Latif Emek, Adilhan Dinura,vd
29	978-605-7510-00-6	Исследования В Области Политики	Hucahmetova Gulnara,Nakisjan A.D, Elshibaeva K. Z.,vd
30	978-605-7510-24-2	Қазақстан Республикасының Экологиялық Проблемалары	Садыкова Дамежан Әділханқызы
31	978-605-7510-44-0	О Праздниках Башкир	Elza Migranova,Galiyeva Farida, Hisamitdinova Firdaus
32	978-605-7510-38-9	Исследования В Области Башкирской И Южно-Сибирской Истории	Elena Tinikova,Rasih Zaytunov,Gaziz Battalov, Rinat Gataullin,vd
33	978-605-7510-42-6	Кыргызстанда Медиа Жана Көчмөн- Жарым Көчмөн Саясаты	Osmonov Samarbek,Mr Nietzhan Ibragimov, Mrs Aigul Niyazgulova
34	978-605-7510-39-6	Исследования В Области Социологии И Антропологии	Albakova Fatima,Raşid Hakimov, Mariyam R. Arpenteva
35	978-605-7510-43-3	Кыргызстанда Жаштар, Улуттук Оюндар Жана Улуттук Кийимдер	Matkarimov N.T.,Nazarakunov Ömürbek, Gareeva V.G.
36	978-605-7510-66-2	The Social Media Report Of The Turkish Radio Market İn The New Digital Age	Mihalıs Kuyucu

37	978-605-7510-96-9	Discussions Between Economic Agents: Individuals, Firms And Countries	Editör Okyay Ucan
38	978-605-7923-81-3	Current Studies Over Social Sciences	Editör Mustafa Talas, Abdullah Karataş , Mustafa Latif Emek
39	978-605-7875-25-9	Discussions Between Economic Agents: Trade Policy, Exchange Rates And Growth	Editör Okyay Ucan
40	978-605-7875-86-0	Social Transformations And Globalization	Editör Kaan Diyabakırhoğlu
41	978-605-7875-23-5	Osmanlı Askeri Teşkilatında Deli Ocağı	Mehibe Şahbaz
42	978-605-7695-18-5	Anadolu Ve Tarih Öncesi Çağlar	Sevcan Yıldız
43	978-605-7695-17-8	Dış Siyasi Olaylarla İlgili TBMM'nin Gizli Oturum Görüşmelerinde Kıbrıs (1974)	Mehmet Salih Mercan
44	978-605-7875-07-5	Küreselleşme, Siyasal Gruplar, Siyasal Kültür-Siyasal İletişim Ve Türkiye	Mustafa Talas

2- FİLOLOJİ ALANINDA YAYINLANAN BAZI KİTAPLARIMIZ

1	978-605-68528-6-2	Қазақ Әдебиеті Бойынша Зерттеулер	Береке Жұмақаева, Алтынай Тымболова, Ибраимова Л.Н.,vd
2	978-605-68528-9-3	Чыңгыз Айтматовдун Чыгармаларында Үй-Бүлөө Жана Табият	Осекова Токтокан,Жумабаева Динара,Сатаева Гулмира,vd
3	978-605-7923-98-1	Tebriz Âşıklık Geleneğinde Mehemmed İle Gülendir Destanı	Nabi Kobotarian
4	978-605-7510-41-9	Кыргыз - Башкурт Тил Жана Адабият Изилдоолору	Akinbekova Ayman, Valiyeva G.D.,Djumayeva J.T.
5	978-605-7695-39-0	Ortaq Türk Leksikasında Qırçaq Mənsəli Sözlər Və Azərbaycan Dilində Arealları	Gönül Samedova
6	978-605-7923-10-3	在幼儿语言文学中修辞艺术的角色	Li Hanlin
7	978-605-7510-30-3	Башкорт Өзәбиәте һәм Ономастикаһы Буйынса Хезмәттәр	Gulgına Şamsutdinova, Mirfatayh Zakiev, Gölfira Abdullina
8	978-605-7510-48-8	Тілдің Дамуы Және Рөлі	Abdirasilova Asel,J.N. Suleimenova,J.A. Abitjanova,vd
9	978-605-7510-45-7	Қазақ Тілі Бойынша Зерттеулер	Jetpisbay Aliya Kojamuratkızı,Moldagali Bakitgul,vd
10	978-605-7510-46-4	Исследования Произведений М.Гафури И Н.Ф. Катанова	Seferova Fera, Valentina Tugujekova,Seferova Esma,vd
11	978-605-7510-37-2	Исследования О Тюркских Эпосах	Aynur Hujahmetov,Svetlana Orus vd
12	978-605-7510-34-1	Хакасские, Башкирские И Алтайские Литературные И Языковые Исследования	Tolisbayeva Janna,İskandarova Svetlana vd.
13	978-605-80227-6-8	Ömrüm Bir Yeşil Yaprak, Renkleri Benimkidir	Ayethan İskenderov
14	978-605-7695-69-7	Ömür Yolum	Günel Vakıfkızı
15	978-625-7954-37-2	Son Qərar	Etibar Həsənzadə
16	978-625-7954-83-9	Azərbaycan Respublikasının Ağdam Rayonu Dialektlərinin Toplanması Ve Linqvistik Təhlili	Elvan Caferov
17	978-625-7954-58-7	O'zbek Adabiyotida Davr Jarohatlari Tasviri	Tavaldieva Gulbahar Nishanovna
18	978-625-7954-56-3	Alisher Navoiy Asarlari Tilidagi Taom Nomlari	Tog'ayev To'liqin Mamanazarovich
19	978-625-7954-55-6	Til Damiyudagi SəzdiK Jumiysiניڭ Rəli	Səduaqas Gulbanu Temirzakyzy
20	978-625-7029-12-4	Səfər Cabbarlının Nəgməli Dünyası	İsmayıl Necefzade
21	978-625-7029-97-1	Karşılaştırmalı Yaygın Kullanımlar İngilizce – Türkçe – Arapça	Halil Uysal
22	978-625-7914-26-0	Serazad Bakışlar	Komisyon
23	978-605-7875-35-8	Anadil Edinci Temelli İkinci Dil Öğrenimi: Minimalist Model	Emrullah Şeker
24	978-625-7914-73-4	Kırmızı Kalem	Dr. Ali Algül
25	978-625-7914-14-7	Tasavvuf Sembollerinin Usüli Divanı İle Fuzüli'nin Türkçe Divanıdaki Kullanışı	Filiz Kalyon

3- GÜZEL SANATLAR ALANINDA YAYINLANAN BAZI KİTAPLARIMIZ			
1	978-605-7510-07-5	Azərbaycan Musiqisində Bahar Mövzusu Və Novruz Motivlərinin İzləri	İlqar İmamverdiyev
2	978-605-7923-80-6	Academic Studies In Fine Arts And Design	Editör Prof. Dr. Mustafa Hilmi Bulut, Dr. Özlem Kaya,
3	978-625-7954-60-0	Семантика Названия Татарских Народных Танцев	Асия Алексеевна Айдарова
4	978-625-7954-59-4	Этноконфессиональное Мировоззрение Наивных И Самодеятельных Художников	Дина Ирековна Ахметова
5	978-625-7954-62-4	Виды Орнаментов В Оформлении Татарских Рукописных Книг Хvii – Начала Хх Веков	Фирдаус Гумаровна Вагапова
6	978-625-7954-61-7	Влияние Гуманистических Идей Джадидизма На Становление Татарского Национального Музыкального Образования (Исторический Аспект)	Альфия Николаевна Валиахметова
7	978-625-7954-71-6	Татар Музыкасы Сəнгатендə Г. Тукай Мирасы	Эльмира Мəнир Кызы Галимова
8	978-625-7954-66-2	Традиционные Виды Женского Рукоделия Татар Иркутской Области	Наталья Владимировна Герасимова
9	978-625-7954-70-9	Истоки Комплекса Технология-Орнамент В Татарской Ювелирной Традиции Чеканки	Лариса Николаевна Донина
10	978-625-7954-65-5	Национальные Мотивы В Творчестве Художников Татарстана Эпохи Постмодернизма (1960–80-Е Годы)	Г. Ибрагимова
11	978-625-7954-68-6	Национальные Мотивы Творчества Казанской Фотогруппы «Тасма»	Дарья Владимировна Рахманова
12	978-625-7954-64-8	Возрождение Войлочного Ковроделия В Республике Татарстан (Творчество Д. И. Р. Рахматуллиных)	Рауза Рифкатовна Султанова
13	978-625-7954-63-1	Скульптура В Дереве Баки Урманче И Отечественная Деревянная Пластика Второй Половины Хх Века	Дина Диасовна Хисамова
14	978-625-7954-67-9	Хайльйым» - Народная Песня На Стихи Габдуллы Тукая	Гузель Файзрахмановна Юнусова
15	978-625-7279-17-8	Azərbaycan Raks Nəvaları Atlası 1. Cilt	Prof. Dr. İlqar Cemiloğlu İmamverdiyev Ali İmamverdi
16	978-625-7897-32-7	Abdurrahim Bey Hakverdiyev ve Çağdaş Azərbaycan Tiyatrosu	Huseyn Ahmadov
18	978-625-7562-76-8	İran Türklerinde Aşık Dügün Törenleri	Prof.Dr. İlqar Cemiloğlu, Firuze İmamverdi
19	978-605-80857-0-1	Görsel İletişimde Çocuk Afişlerinin Hedef Kitle Üzerindeki Etkisi	Yusuf Söylemez
20	978-605-7510-70-9	Gelenekten Geleceğe Ebru	Tahsin Bozdağ
21	978-625-7279-03-1	Jenerik Tasarım Analizi	Kübra Göymen
22	978-625-7029-07-0	Görsel Sanatlarda Hareket Unsurları	İbrahim Kaya
23	978-625-7897-19-8	Sanatın Gölgesinde	Editör: Doç. Dr. Recep Uslu
24	978-605-7923-44-8	Geleneksel Atık Değerlendirme Kırkyama	Selma Önbaş, Serap Mutlu
25	978-605-7923-95-0	Takının Sanata Dönüşümü	Öğr. Gör. Zeliha Sarıkaya Hünere

4- FEN BİLİMLERİ VE MATEMATİK ALANINDA YAYINLANAN BAZI KİTAPLARIMIZ			
1	978-625-7954-69-3	Информатика Сабагында Жеті Модульді Тиімді Пайдалану	Meirhanova Zhanar Toleugazinovna
2	978-625-7954-72-3	Стойкость Материала Индикаторного Электрода Из Никеля В Различных Средах	A.C. Мусина Г.У. Байгашева Е.П. Горбуличева Магистрант Г.Е. Амантай
3	978-605-7695-24-6	Fundamental Aspects Of Engineering Science	Editör Fatih Ünal, Ahmet Erhan Akan
4	978-605-7510-35-8	Химия Саласы Бойынша Зерттеулер	Mirzahmetova N.O. , Amisbayeva A.K.,K,Vd
5	978-605-7510-31-0	Биология Саласы Бойынша Зерттеулер	Anuarova L.E.,Azimbayeva G.E., Ahtayeva M.B.,Vd
6	978-605-7510-49-5	Егін Шаруашылығы Жəне Ютология Саласындағы Зерттеулер	Berik N.T.,Ösetova J.A.,Medeuova G.J.,Mirzahmetova Vd
7	978-625-7897-09-9	English For Mathematicians And Physicists	R.O. Ozgambayeva, A.B. Kokazhaeva, B. Zhakashbaev
8	978-605-7811-72-1	Ecology Of Interior: Embodied Carbon Of Housing	Hayrettin Meriç
9	978-625-7897-03-7	Экотоксикология	Ғ.Ж.Медуова
10	978-625-7897-02-0	Қазақстан Республикасының Экологиялық Проблемалары	Садықова Дамежан Әділханқызы
11	978-625-7279-76-5	Innovative Theories In Science And Environment	Edited By: Assist. Prof. Dr. Tülay Gürsoy
12	978-625-7279-67-3	Multidisciplinary Studies On Recent Advances In Science And Engineering – Experimental And Theoretical	Edited By: Assist. Prof. Dr. Ege Anil Diler
13	978-625-7139-55-7	Engineering On Energy Materials	Edited By: Dr. Defne Akay
14	978-625-7139-43-4	Scientific Studies In The Field Of Sciences	Edited By: Dr. Neslihan Bal
15	978-625-7897-59-4	Current Studies At Positive Sciences	Edited By:Dr. Mehriban Emek, Dr. E. İhan Şahin
16	978-625-7687-43-0	Ecology Dystopia And Fictionalization	Bülent Cercis Tanrıtanır,Fatma Karaman
17	978-605-74646-3-7	Current Approaches In Science Of Life	Edited By: Dr. Betül Aydın
18	978-605-74646-1-3	Natural Sciences: Methods And Applications	Edited By: Dr. Seda Çetindere

19	978-625-7636-13-1	Nitel Analiz Laboratuvar Uygulamaları	Prof. Dr. Nazife Aslan Arş. Gör. Mustafa Ali Güngör
20	978-625-7897-97-6	Aletli Analiz Laboratuvarı	Öğr. Gör. Esmâ Mutlutürk, Prof. Dr. Sevi Öz
21	978-625-7897-18-1	Nanomalzeme Sentezi ve Güncel Kullanım Alanları	Editörler: Doç. Dr. Cumali Keskin, Doç. Dr. Mehmet Fırat Baran
22	978-625-7029-03-2	Hidrolojik Verilerin Değişkenlik Analizi ve Uygulamaları	Dr. Naci Büyükkaracığan
23	978-625-7029-11-7	Bulanık Mantık Yöntemi ve Uygulamaları	Mehmet Nuri Ödük
24	978-625-7954-22-8	Bilgisayar Oyun Arayüzlerinde Grafik Tasarım	Kürşat Karışmaz
25	978-605-7811-87-5	Gıdaların Kurutulmasında Mikrodalga ve Sıcak Hava Yöntemleri	Dr. Öğr. Üyesi Gülçin Yıldız, Doç. Dr. Gökçen İzli

5- MÜHENDİSLİK ALANINDA YAYINLANAN BAZI KİTAPLARIMIZ

1	978-605-7695-24-6	Fundamental Aspects Of Engineering Science	Edited By: Assist. Prof. Fatih Ünal Lecturer Dr. Ahmet Erhan Akan
2	978-605-7811-72-1	Ecology Of Interior: Embodied Carbon Of Housing	Lecturer Hayrettin Meriç
3	978-625-7139-55-7	Engineering On Energy Materials	Edited By: Dr. Defne Akay
4	978-625-7279-45-1	Strategic Management Of Crisis And Disaster	Dr. Naci Büyükkaracığan
5	978-625-7279-67-3	Multi-disciplinary Studies On Recent Advances In Science And Engineering – Experimental And Theoretical	Edited By: Asst. Prof. Dr. Ege Anıl Diler
6	978-625-7279-76-5	Innovative Theories In Science And Environment	Edited By: Assist. Prof. Dr. Tülay Gürsoy
7	978-625-7687-10-2	Current Researches In Architecture And Engineering Sciences	Edited By: Assist. Prof. Dr. Çiğdem Bogenç
8	978-625-7687-12-6	Academic Approaches To Engineering Issues	Edited By: Dr. Ahmet Erhan Akan Dr. Aytaç Perihan Akan
9	978-625-7636-70-4	Recent Advances In Material Science And Engineering Systems	Komisyon
10	978-625-7636-73-5	Experimental And Numerical Advances In Science, Engineering And Technology	Komisyon
11	978-625-7636-95-7	Biological Activities, Health Benefits, Extraction Methods, Food Applications And Beneficial Effects Of Essential Oils	Filiz Yangırlar
12	978-625-7562-47-8	Machine Learning, Energy And Industrial Applications In Technology And Engineering Sciences	Komisyon
13	978-625-7687-73-7	Yapay Sinir Ağları ile Kalite Kontrol: Örnek Olay Çalışması	Birce Yavuz, Dr. Tülay Korkusuz Polat
14	978-625-7562-52-2	Teknoloji ve Mühendislik Bilimlerine Güncel Bakış	Editör: Dr. Abdul Vahap Korkmaz
15	978-625-7562-08-9	Matlab Ortamında Derin Öğrenme Uygulamaları	Dr. Öğr. Üyesi Sedat Metlek Öğr. Gör. Dr. Halit Çetiner
16	978-625-7562-01-0	Eurocode 7 Standartına Göre Temellerde Taşıma Gücü	Öğr. Gör. Hüseyin Mungan
17	978-625-7636-72-8	Modern Mühendislik Yöntemleri ve Uygulamaları	Editör: Dr. Öğr. Üyesi Muhammed Ordu
18	978-625-7279-78-9	Zeminlerinin Sıvılaşma Potansiyelinin Arazi ve Laboratuvar Deneyleri ile Araştırılması	Doç. Dr. Ali Ateş
19	978-625-7279-74-1	Makine Öğrenmesinde, Teoriden Örnek Matlab Uygulamalarına Kadar Destek Vektör Makineleri	Dr. Öğr. Üyesi Sedat Metlek Dr. Öğr. Üyesi Kıyas Kayaalp
20	978-625-7897-29-7	Dijital Mühendislik	Editör: Dr. Gürçan Yavuz
21	978-625-7897-71-6	Katmanlı Kompozit Plakların Nonlineer Serbest Titreşim Analizi	Doç. Dr. İhsan Küçükrendeci
22	978-625-7897-95-2	İşletme İzin Sürecinin Madencilik Sektörüne Etkileri	Arş. Gör. Dr. Taşkın D. Yıldız
23	978-625-7897-99-0	Yer bilimleri Problemlerine Model Yaklaşımları	Editör: Dr. Fatih Sünbül
24	978-625-7279-57-4	Mühendislik Bilimlerinde Güncel Araştırmalar	Editör: Dr. Ramazan Şener

6- Ziraat, Orman ve Su Ürünleri Alanında Yayımlanan Bazı Kitaplarımız			
1	978-625-7687-40-9	Cereal Grain: Productions and Improvement	Komisyon
2	978-625-7687-07-2	Ornamental Plants In Different Approaches	Komisyon
3	978-625-7279-66-6	New Approaches and Applications In Agriculture	Komisyon
4	978-625-7687-33-1	Ornamental Plants: With Their Features and Usage Principles	Komisyon
5	978-625-7914-59-8	Аспекты Материальной Культуры Тюркских Народов	A. Саппагаров, З.М. Калаханова
6	978-625-7687-41-6	Innovative Approaches In Meadow- Rangeland and Forage Crops	Komisyon
7	978-625-7687-44-7	Research In Medicinal and Aromatic Plants	Komisyon
9	978-605-70345-0-2	Aquaculture And Biotechnology	Latife Ceyda İrkin
10	978-625-7636-03-2	Veterinary Medicine And A New Look At Beekeeping	Edited By: Assist. Prof. Dr. Tuba Özge Yaşar
11	978-625-7636-37-7	Crop Production And Influencing Factors	Abdulgani Devlet
12	978-625-7636-90-2	New Development On Medicinal And Aromatic Plants	Edited By: Assist. Prof. Dr. Gülen Özyazıcı
13	978-625-7636-89-6	Sustainable Forage Production And Ecological Safety	Edited By: Assoc. Prof. Dr. Gülcan Demiroğlu Topçu, Assoc. Prof. Dr. Seyithan Seydoşoğlu
14	978-625-7562-11-9	Fertilizers And Their Efficient Use In Sustainable Agriculture	Edited By: Assoc. Prof. Dr. Korkmaz Bellitürk Assoc. Prof. Dr. Zubair Aslam
15	978-625-7562-09-6	Recent Headways In Pomology	Edited By: Assist. Prof. Dr. Mine Pakyürek
16	978-625-7562-37-9	Theoretical And Practical New Approaches In Cereal Science And Technology	Edited By: Assoc. Prof. Dr. Mehmet Karaman
17	978-625-7562-62-1	Highly Interconnected & Endless Puzzle: Agricul Ture	Komisyon
18	978-625-7562-88-1	Clinical And Basic Studies In Veterinary	Komisyon
19	978-625-7562-91-1	Grain Legumes Under Abiotic Stress: Yield, Quality, Enhancement and Acclimatization	Editör: Prof. Dr. Murat Erman
20	978-625-7562-92-8	Overview on Horticulture	Editör: Doç. Dr. Arzu Çiğ
21	978-625-7279-65-9	Serdivan'ın (Sakarya) Kompost Gübre Potansiyeli	Fatih Kenar, Zerrin Karakuzulu
21	978-625-7279-25-3	Tüm Yönleri ile Kuzey Doğu Anadolu Bölgesinde Hayvancılık	Editör: Prof. Dr. Pınar Ayvazoğlu Demir
23	978-605-7875-88-4	Her Yönüyle Kinoa Önemi, Kullanılması ve Yetiştiriciliği	Prof. Dr. Mustafa Tan, Doç. Dr. Süleyman Temel
24	978-605-7811-78-3	Çanakkale'de Çeltik Yetiştirilen Alanlarda Bulunan Zararlı ve Faydalı Böcek ve Yabancı Ot Türleri	Komisyon
25	978-625-7562-61-4	Kalkınma Odaklı Doğal Kaynak Temelli İnovasyon	Editör: Zir. Yük. Müh. Feyza Döndü Bilgin

7- EĞİTİM BİLİMLERİ ALANINDA YAYINLANAN BAZI KİTAPLARIMIZ			
1	978-605-7510-40-2	家庭教育与关系	Konyrbayeva S.S
2	978-605-7510-32-7	Educational Policies In Kazakhstan	Talipova F.O., Eselbaeva A.K., Tutibaev K.A., Nauryzbekova S.M., Vd
3	978-605-7510-36-5	Hunarmandchilik Va Bilim Tadqiqotlari	Zhumasheva T.S, Davlatova Saodat, Zhubandykova A. M., Vd
4	978-605-7510-62-4	Basic English For Elementary And Pre-Intermediate Learners	Abdrassilova Turarkul Nazarbaeva, Vd
5	978-625-7954-45-7	География Курстарының Өлкетану Жұмыстарын Ұйымдастырудағы Мүмкіндіктері	K. N. Mamirova
6	978-625-7954-46-4	Подготовка Будущих Учителей	Kenzhetayeva Gül, Nurzhanova Sazhil
7	978-625-7954-51-8	Графические Органайзеры На Уроках Русского Языка И Литературы	Tasanbaeva Magirash Anuarbekovna Sopbekova Alia Edigeevna
8	978-625-7954-47-1	Vt Технологии В Образовании	Жанабай А. Н., Ерболат Б. Р., Габитқызы А., Бейсенбаева А. Б.
9	978-625-7954-49-5	Бастауыш Сыныпта Қазақ Тілін Оқыту Әдістемесінің Дамуы (1990–2017)	Уайсова Гулнар
10	978-625-7954-52-5	Ағылшын Тілін Оқытуда Оқушылардың Сөйлеу Дағдыларын Қалыптастыру Мақсатында Тиімді Әдістер Мен Жаттығуларды Пайдалану	Мейрханова Гулнар Толеугазиевна
11	978-625-7954-53-2	Түркілік Отансүйгіштік Дәстүр Негізіндегі Патриоттық Тәрбие	Ақжолова Ақтоты Төлеумұратқызы, Дүйсенбаев Абай Қабақбайұлы
12	978-625-7954-48-8	Особенности Развития Творческих Способностей В Младшем Школьном Возрасте	Гусмановна Гайнуллинка

13	978-625-7954-50-1	К Вопросу О Формировании И Развитии Межкультурной Компетенции В Процессе Иноязычной Подготовки Будущих Педагогов	Эльмира Шавкатовна Салимзянова
14	978-625-7954-54-9	Театрализация Как Средство Развития Творческой Самореализации Учащихся При Обучении Иностранному Языку	Эльмира Мунировна Сафиуллина
15	978-625-7954-57-0	Основа Будущего – Образование	Марияс Садыкова
16	978-625-7029-93-3	European Union's Integrated Educational Policy Background And Involved Political Institutions	Soner Akin
17	978-605-7695-73-4	Socio - Political Functions Of Education Critical Views On The Education	Seyyed Muhammad Reza Husseini , Akbar Valadbigi
18	978-625-7897-01-3	Әлеуметтік Экология Және Турақты Даму	Садыкова Дамежан Әділханқызы
19	978-625-7897-03-7	ЭКОТОКСИКОЛОГИЯ	F.Ж.Медеуова
20	978-605-7811-86-8	Practical English For Elementary And Pre-intermediate Learners	M.Z. Berkutbayeva, B.M. Sultanova, Vd
21	978-625-7139-48-9	(جمعية المقاصد الخيرية الاسلامية في بيروت 1914 / 1878 في ضوء الوثائق العثمانية)	الدكتور خالد عبد القادر الجندي
22	978-605-7923-90-5	Küreselleşme Teknolojik Yenilikler Ve Eğitim Araştırmaları	Komisyon
23	978-625-7954-43-3	Eğitim Örgütlerinde Liderlik Sinizm Ve Bağlılık	Dr. Eray Demirçelik
24	978-605-7923-11-0	Kuzey Kıbrıs Türk Cumhuriyeti'nin Coğrafi Özellikleri Ve Bu Özelliklerin Eğitime Yansımaları	Erol Kapluhan
25	978-605-7875-14-3	Yurtdışında Türkçe Öğretimi	Bayram Arıcı

8- SAĞLIK BİLİMLERİ ALANINDA YAYINLANAN BAZI KİTAPLARIMIZ

1	978-605-7923-21-9	New Approaches In Health Sciences	Komisyon
2	978-625-7279-35-2	Mesenchymal Stem Cells (Especially Adipose-Derived Stem Cells): Innovative Therapeutic Approachs	İlhan Özdemir, Şamil Öztürk
3	978-625-7279-36-9	Evaluation of the Effect of Fresh Embryo and Frozen Embryo Transferred on Pregnancy in Infertile Patients	Assoc. Prof. Dr. Cenap Ekinci, Lecturer İlhan Özdemir
4	978-625-7139-76-2	Medical and Health Sciences	Edited By: Assist. Prof. Dr. Seyhan Çankaya
5	978-625-7897-22-8	Health and Science	Editors: Prof. Dr. Sevi Öz, Assoc. Prof. Dr. Yasemin Taşçı
6	978-625-7687-01-0	Recent Studies In Health Sciences	Edited By: Assist. Prof. Dr. Selen Müftuoğlu
7	978-625-7636-85-8	Different Views And Approaches in Health Sciences	Edited By: Assist. Prof. Dr. Müslüm Toptan Spec. Dr. Zeliha Ayhan
8	978-625-7636-82-7	Important Issues in Health Sciences	Edited By: Prof. Dr. Mehmet Bayraktar
9	978-625-7636-71-1	Overview To Covid-19 Pandemic	Editors: Assist. Prof. Dr. Şerif Kurtuluş Assoc. Prof. Dr. Nebiye Yentur Doni
10	978-605-70345-1-9	The Place and Definiton of Fibrous Astrosides In The Studies	Şenay Deveci, Engin Deveci, İlhan Özdemir, Fırat Aşır
11	978-625-7562-84-3	Perspectives In Health and Medicine	Komisyon
12	978-625-7562-59-1	Overview Of Some Current Medicine Issues	Editor: Assoc. Prof. Dr. Bilge Aslan
13	978-625-7562-71-3	Güncel Gelişmeler Işığında Klinik Uygulamalar	Editör: Doç. Dr. Rahime Bedir Findik
14	978-625-7562-63-8	Cerrahi Temelli Hastalıklarda Tıbbi Tani Ve Tedavi Yöntemleri	Editörler: Doç. Dr. Feray Aydın Doç. Dr. Özgür Albuz
15	978-625-7562-51-5	Temel Tıp Ve Klinik Uygulamalar	Editör: Prof. Dr. Yasemin Taşçı
16	978-625-7562-45-4	Cerrahi Bilimlerde İnovatif Yaklaşımlar	Dr. Öğr. Üyesi Kerim Güzel
17	978-625-7562-31-7	Hemşire ve Ebelere Yönelik: Doğum Ağrısında Kullanılan Nonfarmakolojik Yöntemler	Arş. Gör. Dr. Ece Kaplan
18	978-625-7562-19-5	Yutma Bozukluklarında Tanı ve Tedavi	Öğr. Gör. Ziya Yıldız
19	978-625-7636-88-9	Dâhili Bilimlere Güncel Yaklaşımlar	Editör: Doç., Dr. Hamit Sırrı Ketten
20	978-625-7636-75-9	Nöropsikiyatriye ve Ağrıya Multidisipliner Yaklaşım	Editör: Dr. Öğr. Üyesi Ülker Atılan Fedai
21	978-605-7695-72-7	Otizm Spektrum Bozukluğu Olan Bireyler İçin Akran Aracılı Uyarlanmış Fiziksel Aktivite Örnekleri	Dr. Erkan Yarımkaya, Prof. Dr. Ekrem Levent İlhan, Doç. Dr. Necdet Karasu
22	978-605-7695-15-4	Oral Anti Kanser Terapi	Huri Seval Gönderen Çakmak
23	978-605-7875-50-1	Özel Oftalmoloji-I-	Editör Cüneyt Karaaslan
24	978-625-7029-37-7	Engelli Çocuğa Sahip Annelerin Psikolojik İyi Oluşları: Bir Model Önerisi	Dr. Öğr. Üyesi Demet Vural Yüzbaşı
25	978-625-7279-93-2	Doku Mühendisliğinde Bilgisayar Destekli Yapay Kemik İskelesi Tasarımı	Editör: Doç. Dr. İsmail Şahin

9- İLAHİYAT ALANINDA YAYINLANAN BAZI KİTAPLARIMIZ

1	978-625-7636-41-4	Teftâzânî'nin Hayatı Ve Es-Sa'dîni Adlı Şerhinin İncelenmesi	Dr. Nihat Tari Editör: Mehmet Gülnihal
2	978-625-7636-35-3	ثقافة الاختلاف في التراث الإسلامي	Dr. Anas Mhd Rıda Alkahwajı
3	978-625-7636-24-7	Mevlânâ Celâleddîn-İ Rûmî'nin Fihi Mâ Fih Kitabında Kur'anî Motifler	Dr. Mazhar Dündar Editör: Dr. Mazhar Tunç
4	978-625-7687-98-0	İslâm Kelâmında Nüzûl-Ü İsâ Retoriği	Hatice Özdemir Ekinci
5	978-625-7687-82-9	Risâletü'l-İslâm Dergisi'nde Fıkıh Yazıları (İnceleme-Metin)	Yayına Hazırlayanlar: Dr. Şükrü Ayrar Dr. Ramazan Tarık, Editör: Dr. İsmail Ekinci
6	978-625-7687-29-4	İbn Ebî İsba'ın Hayatı Ve Belâgat İlmindeki Yeri	Dr. Mustafa İbiş
7	978-625-7687-18-8	Nahiv İlletleri – İbnu'l Varrâk Örneği –	Dr. Mansur Teyfur
8	978-625-7279-13-0	Sûfi Şair İbnu'l-Fârid, Hayatı ve Divânı (Şiirlerindeki Tasavvufî Temâlar ve Edebî Sanatlar)	Yaşar Seracettin Baytar
9	978-625-7279-09-3	Yûnus Emre'nin Eserlerinde Din ve Değerler Eğitimi	Rıdvan Demir
10	978-625-7139-89-2	Kelâmcıların Tevhid Müdafası	Fikret Soyâl
11	978-625-7139-71-7	Anadolu'da Din: Roma Dönemi	Levent Alpaslan
12	978-625-7914-62-8	Çârperdi Bibliyografyası	Dr. Abdullah Bilin, Editör: Ramazan Tarık
13	978-625-7914-00-0	Kur'an'da Özeleştirî	Musa Turşak, Editör: Mehmet Altın
14	978-605-7695-67-3	Türkiye'de Küreselleşme Ekonomi ve Din	İsmail Ekinci
15	978-605-7695-49-9	İstanbul Yahudilerinin Kimlik Tanımları Üzerine Bir Alan Araştırması	Dr. Ferda Şule Kaya
16	978-605-7923-02-8	İslâm'da İletişim, Toplu Yaşam ve Komşuluk	Rana Özyurt Kaptanoğlu, İlyas Özyurt
17	978-605-7695-23-9	İslâm Ceza Hukukunun Temel Prensipler	Hilal Özay
18	978-605-7510-65-5	İlahiyat Yazılar	Editör: Doç.Dr. Veysi Ünverdi
19	978-605-7510-08-2	İnancın İman Hayatına Yansıması Bağlamında- Deizm Eleştirisi	Dr. Erol Çetin
20	978-625-7636-10-0	Dindarlık ve Kişilik (Ergenler Üzerine Bir Araştırma)	Dr. Mehmet Emin Kalgı

10- MİMARLIK TASARIM VE PLANLAMA ALANINDA YAYINLANAN BAZI KİTAPLARIMIZ

1	978-625-7954-74-7	Enerji Etkin Kent Planlaması	Editör: Prof. Dr. Özge Yalçın Ercoşkun
2	978-605-7510-05-1	Giysi ve Mimari Yapı Tasarımında Disiplinlerarası Etkileşim	Nuray Demirel Akgül
3	978-605-80857-2-5	Geleneksel Bayburt Mimari Mirasının Korunması ve Yaşatılması Bağlamında Talip Yeşil Evi Restorasyon Çalışması	Ece Güler, Özge Ceylin Yıldırım Mazlum Kalak
4	978-605-7695-25-3	Mimarlık Alanında Güncel Çalışmalar	Editör: Dr. Öğr. Üyesi Merve Tuna Kayılı
5	978-625-7954-75-4	Enerji Etkin Kent Tasarımı	Editör: Prof. Dr. Özge Yalçın Ercoşkun
6	978-625-7914-01-7	Kentsel Dönüşüm ve Karabük	Sevilay Doğdu Kaya Dr. Öğretim Üyesi Kemal Yama
7	978-605-7923-73-8	Huzureverindeki Yaşlıların Çevresel Memnuniyet ve Tercihleri	Dr. Emine Tarakçı Eren, Prof. Dr. Mustafa Var
8	978-605-7923-82-0	Disiplinlerarası Çevre Araştırmaları	Editör: Dr. Abdullah Karataş
9	978-605-80857-3-2	Kente Karşı İşlenen Suçların Faili İmar Afları	Dr. Mehmet Akalın
10	978-625-7562-46-1	Mimari Tasarımda Farklı Perspektifler	Editör: Dr. Fatma Kolsal
11	978-625-7562-34-8	Konutlarda Mekânsal Kalitenin Kullanıcı Yoluyla Değerlendirilmesi: Samsun Örneği	Dr. Öğretim Üyesi Alper Bodur Arş. Gör. Kader Keskin
12	978-625-7636-65-0	Planning, Design And Management In Landscape Architecture	Editör: Assoc. Prof. Dr. Arzu Altuntaş
13	978-625-7636-33-9	Yaşlı Bireylerin Mekân Kullanım Tercihleri	Gizem Özer Baş
14	978-625-7636-23-0	Artificial Intelligence-Aided Product Design Practices	Lecturer Hayrettin Meriç
15	978-625-7687-89-8	İç Mimaride Perde ve Perde Görevi Gören Elemanlar	Gizem Zincirkıran Can, Deniz Demirarslan
16	978-625-7687-10-2	Current Researches In Architecture And Engineering Sciences	Edited By: Assist. Prof. Dr. Çiğdem Bogenç
17	978-625-7897-92-1	Tasarım ve Tasarım Süreci	Deniz Demirarslan, Oğuz Demirarslan
18	978-625-7897-47-1	Geleneksel ve Çağdaş Mimari Yapılar Üzerine Akademik Çalışmalar	Editör: Doç. Dr. Murat Dal
19	978-625-7914-27-7	Mekân Organizasyonunda Eyvanın Rolü ve Önemi	Arş. Gör. Mazlum Kalak Arş. Gör. Merve Akdaş
20	978-625-7914-29-1	Gelenekselden Moderne Yapı Tasarımı ve Malzemesi	Editör: Dr. Öğr. Üyesi Berivan Yılmaz Polat

YAYINLANAN BAZI KİTAPLAR				
	ISBN	YAYIN YILI	ESER ADI	YAZAR- EDITÖR
1	978-605-9885-00-3	2015	Sürdürülebilir Kalkınma ve Yenilenebilir Enerji	Komisyon
2	978-605-9885-07-2	2016	مؤسسات العمل الخيرية الواقع والمأمول دراسة تقييمية للمؤسسات في المملكة العربية السعودية	Maha Hamdan Alanazi
3	978-605-9885-54-6	2017	Küresel Bakış	A. Baran Dural, Bahriye Eserler, Recep Cengiz, Zehra Gürsoy
4	978-605-68528-7-9	2018	Экология Зерттеулері: Қазақстан	Медеуова Ғалия, Садькова Дамежан, Жайлыбай К.Н., Vd
5	978-605-7923-98-1	2019	Tebriz Aşıklık Geleneğinde Muhammed İle Güleendam Destanı	Nabi Kobotarian
6	978-625-7954-23-5	2020	The Current Approaches In Tourism	Editör Alper Ateş, Kadriye Alev Akmeşe
7	978-625-7687-76-8	2021	Zafer Sedası	Zerengiz Demirçi Qayalı

ÜNİVERSİTELERİN KÜTÜPHANELERİNDE BULUNAN BAZI KİTAPLARIMIZ				
A- BASILI YAYIN KATOLOG BİLGİSİ				
	KİTAP ADI	YAZAR-EDİTÖR	KURUM	KATALOG NUMARASI
1	Tıbbi ve Aromatik Bitkiler Uçucu Yağlı Bitkiler	Komisyon	Tatarstan Academy of Sciences	193479
2	Discussions Between Economic Agents: Individuals, Firms And Countries	Komisyon	Tatarstan Academy of Sciences	193480
3	Klâsik Türk Edebiyatı Yazıları (Mecmû'a Tasnifi, Gazel Şerhi, Küçürek Hikâye, Mesnevi Şerhi Sözlüğü, Münşe'ât Mecmû'aları	Prof. Dr. Atabey Kılıç, Öğr. Gör. Mustafa Alkan, vd.	Alisher Navo'i Tashkent State University of Uzbek Language and Literature	39836 3836-1
4	İlkokullar İçin Analitik Yazma	Doç.Dr. Yasin Özkara	Alisher Navo'i Tashkent State University of Uzbek Language and Literature	3837
5	Yeni Dünya Düzeninde Yönetim Yaklaşımları	Komisyon	Alisher Navo'i Tashkent State University of Uzbek Language and Literature	3838
6	Uluslararası Göç Bağlamında Türkiye'deki Suriyeli Göçmenlerin Mekânsal Yoğunlaşması	Celal İnce	Azərbaycan Milli Elmlər Akademiyası	T-10532
7	Çocukluk Gençlik ve Yaşlılık Üzerine Araştırmalar	Prof.Dr. Mustafa Talas	Azərbaycan Milli Elmlər Akademiyası	T-10531
8	Küreselleşme Sürecinde Teknolojik Yenilikler ve Eğitim Araştırmaları	Doç. Dr. E. Yalçinkaya	Azerbaijan National Library	I25D1C2EBA62
9	Osmanlı Askeri Teşkilatında Deli Ocağı	Ş. Mehibe; Edt. Prof. Dr. H. Selçuk	Azerbaijan National Library	I25D1C2EB9F3
10	Studies on Economic Development	Edt. Prof. C. S. Akın, C. Aytun	Azerbaijan National Library	I25D1C2EBA02
11	İnançın İman Hayatına Yansıması Bağlamında Deizm Eleştirisi	Erol Çetin	Ходжа Ахмет Йесеви университети	211.5 ÇET
14	George Orwell'ın Bin Dokuz Yüz Seksen Dört Ve Hayvan Çiftliği Adlı Eserlerinin "Soğuk Savaş" Üzerinden Değerlendirilmesi	Gökhan Bak vd.	Ходжа Ахмет Йесеви университети	909- BAK
15	Anadolu'da Rum İhtilal Teşkilatı (Pontus Meselesi)	M. Salih Mercan	Ankara Hacı Bayram Veli Üniversitesi Turizm Fakültesi Kütüphanesi	E2147828810.1
17	KURAN'IN IŞIĞINDA İSTİŞARELER	Ali Rıza Gül,Abdulhalim Aydın, Naif Yaşar	Ankara Hacı Bayram Veli Üniversitesi Turizm Fakültesi Kütüphanesi	E2333297737.1
18	Küresel Bakış	A. Baran Dural, Bahriye Eserler, Recep Cengiz, Zehra Gürsoy	Ankara Hacı Bayram Veli Üniversitesi Turizm Fakültesi Kütüphanesi	E3392869326.1
20	Anadolu'da Rum İhtilal Teşkilatı (Pontus Meselesi)	M. Salih Mercan.	Çankaya Üniversitesi Kütüphanesi	DR 589 M47 2019
21	Küreselleşme, Siyasal Gruplar, Siyasal Kültür- Siyasal İletişim Ve Türkiye	Talas, Mustafa.	Çankaya Üniversitesi Kütüphanesi	JQ 1809 T35 2019
22	Discussions Between Economic Agents: Individuals, Firms And Countries	Ucan, Okyay.	Çankaya Üniversitesi Kütüphanesi	HC 492 D57 2018
23	Mısır Arapçasındaki Türkçe	Uysal, Halil	Çankaya Üniversitesi Kütüphanesi	PJ 6582. T8 U97 2018
24	Türk Yaratılış Ve Türeyiş Destanları ve Dini Motifler	Aksoy, Numan Durak.	Çankaya Üniversitesi Kütüphanesi	GR 280 A36 2018
25	Orta Gelir Tuzağı ve BRICS Ülkeleri	Ülger, Özlem,	ODTÜ 3rd Floor A Block	HC59.7. U38 2018

26	Sivil Toplum, Siyasal Sistem ve Siyasal Yönetim	Mustafa Talas, Erdem Hilal.	ODTÜ 3rd Floor A Block	JQ1809.A15. S624 2018
27	Uluslararası Göç Bağlamında Türkiye'deki Suriyeli Göçmenlerin Mekânsal Yoğunlaşması	Celal İnce	ODTÜ 3rd Floor A Block	JV8745. I36 2018
28	Osmanlı Askeri Teşkilatında "Deli Ocağı"	Dr. Mehibe Şahbaz.	ODTÜ 3rd Floor A Block	UA812. S131 2018
29	İnançın İman Hayatına Yansımaları Bağlamında: Deizm Eleştirisi	Dr. Erol Çetin.	ODTÜ 3rd Floor A Block	BL2773 .C423 2018
30	Göçün Ardından	Fatma Nisan, Eylem Şentürk Kara	ODTÜ 3rd Floor A Block	JV8745. N722 2018
31	Çok Kültürlülük Yaklaşımı ve Sorunsalları	Doç. Dr. Akif Akto.	ODTÜ 3rd Floor A Block	HM1271. A315 2018
32	Academic Studies in Fine Arts and Design	Edited by Mustafa Hilmi Bulut, Özlem Kaya.	ODTÜ 3rd Floor A Block	ND699.T447. A18 2018
33	Toplumsal ve Siyasal Bilim Araştırmaları	Editör Mustafa Talas.	ODTÜ 3rd Floor A Block	JA81. T626 2018
34	Türk Yararlı ve Türeyiş Destanları ve Dini Motifler	Numan Durak Aksoy; editör Yunus Emre Tansü	ODTÜ 3rd Floor A Block	GR280. A315 2018
35	Discussions Between Economic Agents: Individuals, Firms and Countries	Edited by Okyay Uçan	ODTÜ 3rd Floor A Block	HD2346.T92. Y195 2018
36	Studies On Economic Development	Edited by Cemil Serhat Akın, Cengiz Aytun	ODTÜ 3rd Floor A Block	HD82. A31 2018
37	Göçün Ardından	Nisan, Fatma. Şentürk Kara, Eylem	Hacettepe Beytepe Kütüphanesi	JV8745 N57 2018
38	Academic Studies in Fine Arts and Design	Bulut, Mustafa Hilmi. Kaya, Özlem.	Hacettepe Beytepe Kütüphanesi	N85 A23 2018
39	Mısır Arapçasındaki Türkçe	Uysal, Halil	Hacettepe Beytepe Kütüphanesi	PJ6582.T8 U97 2018
40	Osmanlı Askeri Teşkilatında "Deli Ocağı"	Şahbaz, Mehibe.	Hacettepe Beytepe Kütüphanesi	UA812 S24 2018
41	Coreldraw & Grafik Tasarım	Kavasoğlu, B. Ruhsar.	Hacettepe Beytepe Kütüphanesi	T385 K38 2018
42	Başkurt Destanı Kuzukürpesi ile Mayanhlulu'nun Varyantlarının ve Dilinin Karşılaştırılması İncelenmesi	Şamsutdinova, Gulgina	Hacettepe Beytepe Kütüphanesi	PL72.6 S26 2018
43	Türk Yararlı ve Türeyiş Destanları ve Dini Motifler	Aksoy, Numan Durak.	Hacettepe Beytepe Kütüphanesi	GR280 A37 2018
45	The Social Media Report Of The Turkish Radio Market In The New Digital Age	Kuyucu, Mihalis (Michael).	Hacettepe Beytepe Kütüphanesi	PN1991.3.T9 K89 2018
46	Akademik Bakış Açısıyla Göç	Abdullah Soykan, Ahmet Çağrı, Ahmet Mazlum vd.	Adıyaman Üniversitesi Gölbaşı MYO Kütüphanesi	JV 6225/A33
48	Küresel Bakış	A. Baran Dural, Bahriye Eserler, Recep Cengiz, Zehra Gürsoy	Adıyaman Üniversitesi Gölbaşı MYO Kütüphanesi	DR477/D87
49	Қазақстанда Туризмнің Дамуы	Садықова Дамежано	Gümüşhane Üniversitesi Merkez Kütüphanesi	EK36BC2D90
50	Қазақ Әдебиеті Бойынша Зерттеулер	Bereke Zhumakaeva (vd)	Gümüşhane Üniversitesi Merkez Kütüphanesi	EK6C9418BA
52	Contemporary World: Policy, Politics And International Relations	Edited by Rahmat Ullah, Co-Editor Sabbir Hasan	Gümüşhane Üniversitesi Merkez Kütüphanesi	EKC1CB4E65
54	Azərbaycan Musiqisində Bahar Mövzusu Və Novruz Motiflərinin İzləri	İlqar İmamverdiyev	Gümüşhane Üniversitesi Merkez Kütüphanesi	EKF9144FAB
55	İnançın İman Hayatına Yansımaları Bağlamında: Deizm Eleştirisi	Erol Çetin	Gümüşhane Üniversitesi Merkez Kütüphanesi	EK729884DC
57	KURAN'IN IŞIĞINDA İSTİŞARELER	Ali Rıza Gül, Abdulhalim Aydın, Naif Yaşar	Şırnak Üniversitesi Merkez Kütüphanesi	ocm0001864555
58	Akademik Bakış Açısıyla Göç	Abdullah Soykan, Ahmet Çağrı, Ahmet Mazlum vd.	Şırnak Üniversitesi Merkez Kütüphanesi	ocm0001864552
60	Akademik Bakış Açısıyla Göç	Abdullah Soykan, Ahmet Çağrı, Ahmet Mazlum vd.	Atatürk Üniversitesi Merkez Kütüphane Z. F. Fındıkoğlu Salonu	6225A3142017 0214758
61	Küresel Bakış	A. Baran Dural, Bahriye Eserler, Recep Cengiz, Zehra Gürsoy	Atatürk Üniversitesi Merkez Kütüphane Z. F. Fındıkoğlu Salonu	1318K9692017 0214759
64	İnançın İman Hayatına Yansımaları Bağlamında Deizm Eleştirisi	Erol Çetin	Atatürk Üniversitesi Merkez Kütüphane Dil ve Edebiyat Salonu	BP166.22Ç3392018 0214762
65	Кәсіптік Билім Беру Жүйесі: Қазақстан	Қырасова З.А....[Et.Al.]	Atatürk Üniversitesi Merkez Kütüphane M. Muhtar Karahanoğlu Salonu	LC 1043K275201 8 0214764
66	Тарихи Сана	Қожақеева П.Т... [et.al.]	Atatürk Üniversitesi Merkez Kütüphane Z. F. Fındıkoğlu Salonu	D16.9T2692018 0214765
67	Исследования В Области Политики	хужахмтова гульнар...[et.al.]	Atatürk Üniversitesi Merkez Kütüphane M. Muhtar Karahanoğlu Salonu	JQ 1802N776201 8 0214766
68	исследования тюркской народной культуры	гульнар юлдыбаева...[et.al.]	Atatürk Üniversitesi Merkez Kütüphane M. Muhtar Karahanoğlu	DS26N776 2018 0214767

B. ELEKTRONİK ORTAMDA KATOLOGLAYAN KURUMLAR*

Cumhurbaşkanlığı Beştepe Kütüphanesi	Fatih Sultan Mehmet Vakıf Üniv.	Mersin Üniversitesi
Abant İzzet Baysal Üniversitesi	Giresun Üniversitesi	Mimar Sinan Üniversitesi
Adana Alparslan Türkeş Bilim ve Teknoloji Üniversitesi	Gümüşhane Üniversitesi	Muğla Sıtkı Koçman Üniversitesi
Adıgüzel Meslek Yüksek Okulu	Hakkari Üniversitesi	Mustafa Kemal Üniversitesi
Adnan Menderes Üniversitesi	Harran Üniversitesi	Namık Kemal Üniversitesi
Afyon Kocatepe Üniversitesi	Hasan Kalyoncu Üniversitesi	Necmettin Erbakan Üniversitesi
Ağrı İbrahim Çeçen Üniversitesi	Hitit Üniversitesi	Nevşehir Hacı Bektaş Veli Üniversitesi
Aksaray Üniversitesi	İğdir Üniversitesi	Ordu Üniversitesi
Alanya Alaaddin Keykubat Üniversitesi	İhsan Doğramacı Bilkent Üniversitesi	Osmaniye Korkut Ata Üniversitesi
Amasya Üniversitesi	İskenderun Teknik Üniversitesi	Ömer Halis Demir Üniversitesi
Anadolu Üniversitesi	İstanbul Arel Üniversitesi	Sakarya Üniversitesi
Ankara Hacı Bayram Veli Üniversitesi	İstanbul Bilgi Üniversitesi	Süleyman Demirel Üniversitesi
Ankara Üniversitesi	İstanbul Cerrahpaşa Üniversitesi	Türk – Alman Üniversitesi
Ardahan Üniversitesi	İstanbul Gelişim Üniversitesi	Uluslararası Fınal Üniversitesi
Artvin Çoruh Üniversitesi	İstanbul Kavram MYO	Uşak Üniversitesi
Atatürk Üniversitesi	İstanbul Kültür Üniversitesi	Üsküdar Üniversitesi
Atılım Üniversitesi	İstanbul Medeniyet Üniversitesi	Yaşar Üniversitesi
Bahçeşehir Üniversitesi	İstanbul Üniversitesi	Yüzüncüyıl Üniversitesi
Balıkesir Üniversitesi	İstinye Üniversitesi	Bursa Büyükşehir Belediyesi
Bandırma Onyediy Eylül Üniversitesi	Kafkas Üniversitesi	Kayseri Büyükşehir Belediyesi
Bartın Üniversitesi	Kahramanmaraş Sütçü İmam Üniversitesi	Kocaeli Büyükşehir Belediyesi
Başkent Üniversitesi	Kıbrıs Amerikan Üniversitesi	Sultangazi Belediyesi
Bayburt Üniversitesi	Kıbrıs Sosyal Bilimler Üniversitesi	Nilüfer Belediyesi
Beykent Üniversitesi	Kırklareli Üniversitesi	Kocaeli BŞB Gebze
Bozok Üniversitesi	Kırşehir Ahi Evran Üniversitesi	İzmit Belediyesi
Bülent Ecevit Üniversitesi	KKTC Doğu Akdeniz Üniversitesi	Gölcük Belediyesi
Cumhuriyet Üniversitesi	KKTC Girne Amerikan Üniversitesi	Başakşehir Belediyesi
Çağ Üniversitesi	Kocaeli Üniversitesi	Büyük Çamlıca Camii Kütüphanesi
Çanakkale 18 Mart Üniversitesi	Malatya Turgut Özal Üniversitesi	Hatay Büyükşehir Belediyesi
Çankırı Karatekin Üniversitesi	Maltepe Üniversitesi	Avcılar Belediyesi
Çukurova Üniversitesi	Manisa Celal Bayar Üniversitesi	Adana Sarıçam Belediyesi
Doğuş Üniversitesi	Marmara Üniversitesi	Darıca Belediyesi
Ege Üniversitesi	MEF Üniversitesi	Gaziantep Büyükşehir Belediyesi
Eskişehir Teknik Üniversitesi		

* HİPERLİNK ALTYAPISI İLE

**SELÇUK ÜNİVERSİTESİ SENATOSU KARARI İLE ALANINDA ETKİNLİĞİ VE SAYGINLIĞI
KABUL EDİLEN ULUSAL VE ULUSLARARASI YAYINEVLERİ**

https://webadmin.selcuk.edu.tr/BirimDosyalar/Dosyalar/rektorluk/ULUSAL_VE_ULUSLARARASI_YAYINEVLERI.pdf

<p>4T YAYINEVİ 7 TURHAN KİTAPEVİ ADALET YAYINEVİ AKADEMİ YAYINEVİ AKADEMİSYEN YAYINEVİ AKÇAĞ YAYINLARI ALFA YAYINLARI ALKİM ANAYASA MAHKEMESİ ANKARA ARIKAN ARİSTO YAYINEVİ ARKEOLOJİ VE SANAT YAYINLARI ASTANA ATATÜRK ÜNİVERSİTESİ BASINEVİ ATLAS AKADEMİ ATLAS YAYINEVİ BANKACILIK VE TİCARET H. ARAŞ. E BERİKAN YAYINLARI BEŞİR KİTAPEVİ BETA YAYINLARI BİLGİN KÜLTÜR SANAT YAYINLARI BİLGİTEK BİLİM BİLLUR YAYINEVİ CAMBRIDGE SCHOLARS PUBLISHING COMING SOON CRC PRESS/TAYLOR ANDA FRANCİS ÇAĞA HUKUK VAKFI ÇANKIRI ARAŞTIRMA MERKEZİ YAYINEVLERİ ÇİZGİ KİTAPEVİ DAYINLARLI DER YAYINLARI LEGAL YAYINCILIK DİGESTA DİVAN KİTAP DOKUZ EYLÜL ÜNİVERSİTESİ DORA YAYINLARI EĞİTEN KİTAP YAYINCILIK EĞİTİM YAYINEVİ EKİN YAYINEVİ ELSEVIER PUBLICATION ENDÜLÜS YAYINLARI</p>	<p>GÜLER OFSET GÜLERMAT MATBAA VE YAYINCILIK GÜNAY OFSET YAYINEVİ GÜNEŞ TIP HECE YAYINLARI ANKARA HEDEF CS HİPER YAYINEVİ HUKUK AKADEMİSİ HUKUK YAYINLARI HÜNER YAYINEVİ İJOPEC PUBLICATION INTECH OPEN INTERTIP IRCICA YAYINLARI İVPE İDEA YAYINEVİ İDEAL KÜLTÜR YAYINCILIK İKİNCİ SAYFA YAYINEVİ IKSAD INTERNATIONAL PUBLISHING İLAHİYAT YAYINLARI İLETİŞİM YAYINLARI İMAJ YAYINEVİ İNSAN YAYINLARI İSAM YAYINLARI İSTANBUL BİLGİ ÜNİVERSİTESİ İZ YAYINCILIK JAGIELLONLAN UNİVERSİTY İNSTITUTE OF PUBLIC AFFAIRS JOHN WILEY&SONS KADİR HAS ÜNİVERSİTESİ KARABÜK ÜNİVERSİTESİ YAYINLARI KAZANCI HUKUK KİTAP DÜNYASI YAYINLARI KÖK YAYINCILIK KÖMEN YAYINEVİ KÜLTÜR YAYINEVİ LAMBERT AKADEMİK YAYINEVİ LAP LAMBERT PUBLISHING LEGAL LGI GLOBAL LİSANS YAYINLARI LİTERA YAYINCILIK LİTERATÜR YAYINEVİ M.Ü İLAHİYAT FAKÜLTESİ VAKFI MAHYA YAYINLARI MALİYE VE HUKUK MİLLİ EĞİTİM BAKANLIĞI YAYINEVİ MONOPOL YAYINLARI</p>	<p>NİKA NOBEL YAYINEVİ ON İKİ LEVHA ÖTÜKEN YAYINLARI PEGEM YAYINCILIK PALET YAYINEVİ PALME YAYINEVİ PARADİGMA AKADEMİ PETER LANG YAYINEVİ RAĞBET YAYINLARI REMZİ KİTAPEVİ S.Ü. MEVLANA ARAŞTIRMALARI ENSTİTÜSÜ YAYINLARI SAGE YAYINEVİ SAVAŞ YAYINEVİ SAY YAYINLARI SAYRAM YAYINLARI SEÇKİN YAYINCILIK SELÇUK ÜNİVERSİTESİ YAYINLARI SELENGE YAYINLARI SENTEZ YAYINCILIK SİVAS CUMHURİYET ÜNV. MATBAASI VE YAYINEVİ SONÇAĞ YAYINLARI SPRİNGER SRA (STRATEGIC RESEARCHES ACEDEMY) TAYLOR ANDA FRANCİS TİMAŞ YAYINLARI TÜRK DİL KURUMU YAYINLARI TÜRK TARİH KURUMU YAYINLARI TÜRKİYE BAROLAR BİRLİĞİ TÜRKİYE DİYANET VAKFI TÜRKİYE KLİNİKLERİ YAYIN EVİ UNİVERSİTY PRESS "ST. KLIMENTOHRIDSKI" US AKADEMİ YAYINLARI UYUŞMAZLIK MAHKEMESİ YAYINLARI VAKIFLAR GENEL MÜDÜRLÜĞÜ YAYINLARI VEDAT KİTAPÇILIK YAPI KREDİ YAYINLARI YEDİTEPE ÜNİVERSİTESİ YEDİTEPE YAYINLARI YEDİVEREN KİTAP YEM YAYINEVİ YETKİN</p>
---	--	--

