


PERSONAL INFORMATION

Kaloyan Kirilov Petrov



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Sex Male | Date of birth 04/12/1969 | Nationality Bulgarian

SCIENTIFIC EXPERIENCE

Optimization of microbial conversion processes by the techniques of bioprocess and metabolic engineering. Utilization of alternative renewable feedstocks. Production of enzymes and value-added chemicals in respect of their industrial application. Process control improvement and strains development.

WORK EXPERIENCE

November 2014 - Present

**Head of Department “Chemical and Biochemical Reactors”**

**Institute of Chemical Engineering, Bulgarian Academy of Sciences**, Acad. G Bonchev str. bl. 103, 1113 Sofia, Bulgaria

July 2014 - Present

**Professor**

**Institute of Chemical Engineering, Bulgarian Academy of Sciences**, Acad. G Bonchev str. bl. 103, 1113 Sofia, Bulgaria

May 2011 - June 2014

**Associate Professor**

**Institute of Chemical Engineering, Bulgarian Academy of Sciences**, Acad. G Bonchev str. bl. 103, 1113 Sofia, Bulgaria

March 2009 – May 2011

**Assistant Professor (fellow rank 1)**

**Institute of Chemical Engineering, Bulgarian Academy of Sciences**, Acad. G Bonchev str. bl. 103, 1113 Sofia, Bulgaria

May 2006 - March 2009

**Assistant Professor (fellow rank 2)**

**Institute of Chemical Engineering, Bulgarian Academy of Sciences**, Acad. G Bonchev str. bl. 103, 1113 Sofia, Bulgaria

April 2003 - May 2006

**Assistant Professor (fellow rank 3)**

**Institute of Chemical Engineering, Bulgarian Academy of Sciences**, Acad. G Bonchev str. bl. 103, 1113 Sofia, Bulgaria

February 2002 - April 2003 **Technologist (Biotechnology)**  
**Institute of Chemical Engineering, Bulgarian Academy of Sciences**, Acad. G Bonchev str. bl. 103, 1113 Sofia, Bulgaria

January 1999 - October 2001 **Technologist (Photolithography)**  
**Silway Semiconductors AD**, Tsarigradsko Shousse Boulevard 7th Km, 1184 Sofia, Bulgaria

July 1998 - December 1998 **Technologist (Chemical control of cosmetic products content)**  
**Aroma AD**, Kiril Blagoev str. 12, 1271 Sofia, Bulgaria

March 1997 - June 1998 **Technologist (Tablet plant)**  
**Sopharma AD**, Iliensko Shousse str. 16, 1271 Sofia, Bulgaria

February 1997 - March 1997 **Specialist**  
**Institute of Microbiology, Bulgarian Academy of Sciences**, Acad. G Bonchev str. bl. 26, 1113 Sofia, Bulgaria

March 1996 - August 1996 **Trader (Sales department)**  
**ORT LLC**, Krustio Sarafov str. 27, 1164 Sofia, Bulgaria

October 1994 - February 1996 **Administrator**  
**Neoset BG AD**, G Rakovski str. 137, 1000 Sofia, Bulgaria

## EDUCATION AND TRAINING

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July 2002 – December 2005 **Doctor of Philosophy**  
**Institute of Chemical Engineering, Bulgarian Academy of Sciences**  
Acad. G Bonchev str. bl. 103, 1113 Sofia, Bulgaria

- Ph.D. Thesis: "Lactic acid production by *Lactobacillus rhamnosus* ATCC 7469, immobilized in polyacrylamide gel"

September 1993 – May 1994 **Master of Science**  
**Technical University - Sofia**  
St. Kliment Ohridski Blvd. 8, 1756 Sofia, Bulgaria

- M.Sc. Thesis: "Optimal control of brewery fermentation process"

September 1989 – June 1993

**Bachelor**

**Technical University - Sofia**

St. Kliment Ohridski Blvd. 8, 1756 Sofia, Bulgaria

- Specialty: “Bioprocess Engineering”

SPECIALIZATIONS

January 2011 – December 2011

**Postdoctoral Fellow**

**Department of Microbiology, University of Stellenbosch**

Private Bag XI, Matieland 7602, Stellenbosch, South Africa

- Thesis: “Isolation and characterization of pathogen organisms from horses with hoof thrush”

PERSONAL SKILLS

Mother tongue(s) Bulgarian

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	B2	C1/C2	B2	B2	C1/C2
Replace with name of language certificate. Enter level if known.					
Russian	C2	C2	B1/B2	B1/B2	B1/B2
Replace with name of language certificate. Enter level if known.					

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2 Proficient user

Driving licence B

RESEARCH EXPERTISE

**Area of competence** Biotechnologies; Applied and industrial microbiology; Biochemistry; Molecular biology; Analytical chemistry

**Scientific directions** Biotechnological production of platform chemicals; Strains improvement for metabolites production; Bioprocess engineering – optimization and control of microbial conversion processes.

SCIENTIFIC METRICS

Total Impact Points: 42.554

Citations: 470

h-index: 11

Articles: 52

Book chapters: 2

Patents: 2

Current projects: 4

ELECTRONIC DATABASES

Scopus <https://www.scopus.com/authid/detail.uri?authorId=13406656700>  
 ORCID <http://orcid.org/0000-0001-9197-0894>  
 ResearchGate [https://www.researchgate.net/profile/Kaloyan\\_Petrov](https://www.researchgate.net/profile/Kaloyan_Petrov)  
 Scholar Google <https://scholar.google.bg/citations?user=xU2upGEAAAAJ&hl=bg>

## SCIENTIFIC ACTIVITY

## Book Chapters

Petrova P., Petrov K. (2017) Prebiotic–Probiotic Relationship: The Genetic Fundamentals of Polysaccharides Conversion by Bifidobacterium and Lactobacillus Genera. In: Food Bioconversion (ISBN: 978-0-12-811413-1), pp. 237-278. (<http://dx.doi.org/10.1016/B978-0-12-811413-1.00007-3>)

Petrova P., Petrov K. (2017) Traditional Cereal Beverage Boza - Fermentation Technology, Microbial Content and Healthy Effects. In book: Fermented Food—Part II: Technological Interventions, Chapter: 13, Publisher: CRC PRESS, Boca Raton, FL, USA, Editors: Ramesh C. Ray and Didier Montet, pp. 284-305. (ISBN 9781138637849).

## Publications

Petrov K., Popova L., Petrova P. (2017) High lactic acid and fructose production via Mn<sup>2+</sup> mediated conversion of inulin by *Lactobacillus paracasei*. *Applied Microbiology and Biotechnology* vol. 101 (11), 4433-4445.

Petrov K., Petrova P. (2017) Sugar transport systems involved in fructooligosaccharides utilization by the probiotic bacterium *Pediococcus acidilactici*. *Comptes Rendus de l'Academie Bulgare des Sciences* vol. 70 (9), 1263-1270.

Popova L., Petrov K. (2017) "Production of platform chemicals from inulin" *Scientific works of University of Food Technologies*, vol. LXIII, (in press). (ISSN 1314-7102)

Velikova P., Petrov K., Petrova P. (2017) The cell wall anchored  $\beta$ -fructosidases of *Lactobacillus paracasei*: overproduction, purification, and gene expression control. *Process Biochemistry*, vol. 52, 53-62.

Velikova P., Petrov K., Tsvetanova F., Petrova P. (2017) Novel isolates of lactic acid bacteria display combined glycoside hydrolase activities. In: Microbiology for a better health and industry, 70<sup>th</sup> anniversary of the Stephan Angeloff Institute of Microbiology, BAS pp. 71-80. (ISBN 978-954-92882-2-3)

Velikova P., Stoyanov A., Blagoeva G., Popova L., Petrov K., Gotcheva V., Angelov A., Petrova P. (2016) Starch utilization routes in lactic acid bacteria: new insight by gene expression assay. *Starch-Stärke* vol. 68 (9/10), 953-960.

Petrova P., Velikova P., Popova L., Petrov K. (2015) "Direct conversion of chicory flour into L(+)-lactic acid by the highly effective inulinase producer *Lactobacillus paracasei* DSM 23505" *Bioresource Technology* vol. 186, 329-333.

Popova L., Petrov K., Petrova P. (2015) "Construction of a new shuttle vector pZT1 applicable to hosts *Escherichia coli* and the ethanol producing *Zymomonas mobilis*" *Ecological Engineering and Environment Protection* vol. 4 (2), 19-23.

Popova L., Petrova P., Petrov K. (2015) Heterologous expression of amylase in *E. coli* and *Zymomonas mobilis* under *sacC* promoter control for ethanol production from starch. *Scientific works of University of Food Technologies*, vol. LXII, 494-498. (ISSN 1314-7102)

Ivanova V., Petrov K., Safarikova M., Safarik I., Petrova P., Tonkova A. Delchev N. (2014) "Immobilization of recombinant CGTase JCGT8-5 on magnetically – modified silicates and natural supports" *International Review of Chemical Engineering* vol. 6 (1), 1-8. (ISSN 2035-1755)

Tsvetanova F., Petrova P., Petrov K. (2014) "2,3-butanediol production from starch by engineered *Klebsiella pneumoniae* G31-A" *Applied Microbiology and Biotechnology* vol. 98 (6), 2441-2451.

Tsvetanova F., Petrov K. (2014) "Influence of pH and aeration on 2,3-butanediol production from glucose by *Klebsiella pneumoniae* G31" *Bulgarian Chemical Communication* vol. 46 (4), 784-787.

Petrov K.K., Dicks L.M.T. (2013) "Footrot in clawed and hooved animals: symptoms, causes and treatments", *Biotechnology & Biotechnological Equipment* vol. 27 (1), 3470-3477.

Petrov K.K., Dicks L.M.T. (2013) "*Fusobacterium necrophorum*, and not *Dichelobacter nodosus*, is associated with equine hoof thrush", *Veterinary Microbiology* vol. 161 (3/4), 350-352.

## Publications

- Petrova P., Petrov K., Stoyancheva G. (2013) "Starch-modifying enzymes of lactic acid bacteria – structures, properties, and applications", *Starch-Starke* vol. 65 (1/2), 34-47.
- Tsvetanova F.V., Petrov K.K., Beschkov V.N. (2013) "Influence of the different media compounds on 2,3-butanediol production in glucose fermentation" *Journal of International Scientific Publications: Ecology and Safety* vol. 7 (1), 257-261. (ISSN 1313-2563)
- Radchenkova N., Vassilev S., Panchev I., Anzelmo G., Tomova I., Nicolaus B., Kuncheva M., Petrov K., Kambourova M. (2013) "Production and Properties of Two Novel Exopolysaccharides Synthesized by a Thermophilic Bacterium *Aeribacillus pallidus* 418" *Applied Biochemistry and Biotechnology* vol. 171 (1), 31-43.
- Petrova P., Tomova I., Petrov K., Nikov I., Tonkova A. (2013) "Purification and properties of a new recombinant cyclodextrin glucanotransferase from *E. coli* BL21 (DE3) pJCGT8-5" *Comptes Rendus de l'Academie Bulgare des Sciences* vol. 66 (10), 1437-1444.
- Blagoeva G., Petrova P., Petrov K., Gotcheva V., Angelov A. (2013) "Amyolytic probiotics with application in food industry" ENGIHR "The Intestinal Microbiota and Gut Health: Contribution of the Diet, Bacterial Metabolites, Host Interactions and Impact on Health and Disease" Valencia, Spain 18<sup>th</sup>-20<sup>th</sup> September 2013, p. 28-32.
- Popova L., Petrov K. (2013) "Optimized electroporation procedure for *Lactobacillus paracasei* transformation" *Scientific works of University of Food Technologies*, vol. LX, 925-929. (ISSN 1314-7102)
- Petrova P., Petrov K. (2012) „Direct starch conversion into L (+) lactic acid by a novel amyolytic strain of *Lactobacillus paracasei* B41" *Starch-Starke* vol. 64 (1), 10-17. (ISSN 0038-9056)
- Petrov K., Stoyanov A. (2012) "Accelerated production of 1,3-propanediol from glycerol by *Klebsiella pneumoniae* using the method of forced pH fluctuations", *Bioprocess and Biosystems Engineering*, vol. 35 (3), 317-321. (ISSN 1615-7591)
- Petrova P., Tsvetanova F., Petrov K. (2012) "Regulation of amylase genes expression in lactic acid bacteria" *New Trends in Microbiology*, In: 65th Anniversary of the Stephan Angeloff Institute of Microbiology, pp. 193-203. (ISBN 978-954-92882-1-6)
- Tsvetanova F.V., Petrov K.K. (2012) "Fermentative biofuels production" *Journal of International Scientific Publications: Materials, Methods & Technology* vol. 6 (2), 425-439. (ISSN 1313-2563)
- Tsvetanova F.V., Petrov K.K. (2012) "Metabolic engineered pathways for branched-chain alcohols as biofuels" *Scientific works of UFT "Food science, engineering and technologies"* vol. LIX, pp.665-668. (ISSN 1314-7102)
- Petrova P., Tonkova A., Petrov K. (2012) "Sequence analysis, cloning and extracellular expression of cyclodextrin glucanotrasferase gene from the alkaliphilic *Bacillus pseudocaliphilus* 8SB in *E. Coli*", *Process Biochemistry* vol. 47 (12), 2139-2145.
- Ivanova I., Tonkova A., Petrov K., Petrova P., Gencheva P. (2012) "Covalent attachment of cyclodextrin glucanotransferase from genetically modified *Escherichia coli* on surface functionalized silica coated carriers and magnetic particles", *Journal of BioScience and Biotechnology*, vol. 1 (SE), 7-13. (ISSN 1314-6246)
- Petrova P., Petrov K. (2011) "Antimicrobial activity of starch-degrading *Lactobacillus* strains isolated from boza". *Biotechnology & Biotechnological Equipment* vol. 25 (4), 114-116. (ISSN 1310-2818)
- Vasileva E., Stoyanov A., Petrov K., Beschkov V. (2011) "Influence of aeration on biodegradation of monochloroacetic acid", *Journal of International Scientific Publications: Ecology & Safety* vol. 5 (1), 190-195. (ISSN 1313-2563)
- Beschkov V., Sapundzhiev T., Petrov K., Vasileva E. (2010) "Mathematical modeling for studying microbial processes – some examples" *Serdica Journal of Computing* vol. 4 (1), 19-28.
- Petrova P., Emanuilova E., Petrov K. (2010) "Amyolytic *Lactobacillus* Strains from Bulgarian Fermented Beverage Boza", *Z. fur Naturforschung C*, vol. 65C (3/4), 218-224.
- Petrov K., Petrova P. (2010) "Enhanced production of 2,3-butanediol from glycerol by forced pH fluctuations", *Applied Microbiology and Biotechnology*, vol. 87 (3), 943-949.
- Vasileva E., Petrov K., Beschkov V. (2010) "Mathematical modelling of biodegradation of monochloroacetic acid by *Xanthobacter autotrophicus* GJ10 immobilized in polyacrylamide gel", *Bulgarian Chemical Communication* vol. 42 (2), 174-179.

## Publications

- Petrov K., Vasileva E., Petrova P., Beschkov V. (2010) "Bulk chemicals from glycerol – the Bulgarian contribution to bio-based diols production" *Journal of International Scientific Publications: Materials, Methods & Technology* vol. 4 (1), 258-266.
- Petrova P., Petrov K. (2010) "Amylolytic lactic acid bacteria and their industrial application" *Journal of International Scientific Publications: Materials, Methods & Technology* vol. 4 (1), 349-358.
- Петров К., Петрова П. (2010) „Влияние на изкуственита рН флукутации върху биоразграждането на глицерол" Сборник доклади Лятна школа - Бургас 2010, 134-138.
- Василева Е., Петров К., Бешков В. (2010) „Биоразграждане на монохлороцетна киселина от клетки на щама *Xanthobacter autotrophicus* GJ10 чрез провеждане на полупериодичен процес с подхранване" Сборник доклади Лятна школа - Бургас 2010, 148-155.
- Цекова К., Денчева В., Петров К. (2010) "Интегриран биотехнологичен процес за получаване на биологично активни вещества от нативно нишесте и почистване на води, замърсени с тежки метали" *Екологично инженерство и опазване на околната среда* №2, с. 50-58.
- Petrova P., Petrov K., Beschkov V. (2009) „Production of 1,3-propanediol from glycerol by newly isolated strains of *Klebsiella pneumoniae*", *Comptes Rendus de l'Academie Bulgare des Sciences*, vol. 62 (2), 233-242.
- Gouliamova D., Dimitrov R., Petrova P., Stoyancheva G., Petrov K. (2009) "Genomic approaches to yeast taxonomy", *Biotechnology & Biotechnological equipment*, vol. 23 (SE), 519–523.
- Petrova P., Gouliamova D., Petrov K., Stoyancheva G., Dimitrov R. (2009) "Starch-degrading activities of Bulgarian yeast isolates", *Biotechnology & Biotechnological equipment*, vol. 23 (SE), 651–654.
- Vasileva E., Petrov K., Beschkov V. (2009) "Biodegradation of monochloroacetic acid by immobilization of *Xanthobacter autotrophicus* GJ10 in polyacrylamide gel", *Biotechnology & Biotechnological equipment*, vol. 23 (SE), 788–790.
- Petrov K., Petrova P. (2009) "Isolation and molecular identification of *Klebsiella pneumoniae* strains, producing diols from glycerol", *Biotechnology & Biotechnological equipment*, vol. 23 (SE), 814–817.
- Petrov K., Petrova P. (2009) "High production of 2,3-butanediol from glycerol by *Klebsiella pneumoniae* G31", *Applied Microbiology and Biotechnology*, vol. 84 (4), 659–665.
- Vasileva E., Beschkov V., Petrov K. (2009) "Review on monochloroacetic acid biodegradation capacity of immobilized cells *Xanthobacter autotrophicus* GJ10", *Food science, engineering and technologies 2009* , vol. 56 (1), 311-318.
- Vasileva E., Petrov K., Beschkov V. (2009) "Fed batch strategy for biodegradation of monochloroacetic acid by immobilized *Xanthobacter autotrophicus* GJ10 in polyacrylamide gel", *Comptes Rendus de l'Academie Bulgare des Sciences*, vol. 62 (10), 1241-1246.
- Petrov K., Urshev Z., Petrova P. (2008) "L (+) - Lactic acid production from starch by a novel amylytic *Lactococcus lactis* subsp. *lactis* B84", *Food Microbiology*, vol. 25 (4), 550-557.
- Petrov K., Penka P., Beschkov V. (2007) "Improved immobilization of *Lactobacillus rhamnosus* ATCC 7469 in polyacrylamide gel, preventing cell leakage during lactic acid fermentation" *World Journal of Microbiology & Biotechnology*, vol. 23 (3), 423-428.
- Petrova P., Petrov K., Stoyancheva G. (2007) "Probiotic properties of Bulgarian vaginal *Lactobacillus* isolates", *Comptes Rendus de l'Academie Bulgare des Sciences*, vol. 60 (8), 871-878.
- Petrov K., Yankov D., Beschkov V. (2006) "Lactic acid fermentation by cells of *Lactobacillus rhamnosus* immobilized in polyacrylamide gel" *World Journal of Microbiology & Biotechnology*, vol. 22 (4), 337-345.
- Danova S., Petrov K., Pavlov P. and Petrova P. (2005) "Isolation and characterization of *Lactobacillus* strains involved in koumiss fermentation" *International Journal of Dairy Technology*, vol. 58 (2), 100-105.
- Petrov. K., Petrova P., Beschkov V. (2005) "Continuous process of lactic acid production using immobilized in polyacrylamide gel *Lactobacillus rhamnosus* ATCC 7469" *Bulgarian Chemical Communication* vol. 37 (3), 173-177.

- Patents** Petrov K., Petrova P., Beschkov V. (2014) "Method for 2,3-butanediol production" BG Patent 66411, Newsletter of the patent office – Jan 2014.  
Petrov K., Beschkov V. (2009) "Method for lactic acid production" BG Patent 65664, Newsletter of the patent office – May 2009.

- Current projects**
- Competition (type and year): National Competition "Young Scientists - 2017"**  
**Number and date of the contract:** DFNP 17-46 / 26.07.2017  
**Title:** New strategies of biotechnological production of butanol: molecular feature of new Bulgarian isolates with increased resistance to butanol stress  
**Project coordinator:** Assist. Professor Flora Tsvetanova, PhD  
**Status of the project:** running
- Financing organization: Bright Dairy & Foods Co. Ltd - 2015**  
**Type of the competition and year:** Scientific projects funded by international or foreign companies, 2015  
**Number or acronym of the project:** "Lactobacilli – China" №1/18.06.2015  
**Title:** „Isolation, identification and characterization of *Lactobacillus* strains isolated from unique homemade Bulgarian fermented milk products"  
**Project coordinator:** Assoc. Professor Penka Petrova, PhD  
**Status of the project:** running, with intermediate report.
- Competition (type and year): Research Funding in Priority Areas - 2014**  
**Number and date of the contract:** DFNI B02/27, 12.12.2014  
**Title:** Advanced molecular approaches for studying the probiotic properties of amylolytic lactic acid bacteria from bulgarian fermented products and technological characterization for potential functional food applications  
**Project coordinator:** Assoc. Professor Velitchka Gotcheva, PhD  
**Status of the project:** running, with intermediate report.
- Competition (type and year): National Competition "Young Scientists - 2011"**  
**Number and date of the contract:** DMU 03/45, 12.12.2011  
**Title:** Amylolytic probiotics with application in food industry  
**Project coordinator:** Assoc. Professor Penka Petrova, PhD  
**Status of the project:** running, with intermediate report.
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