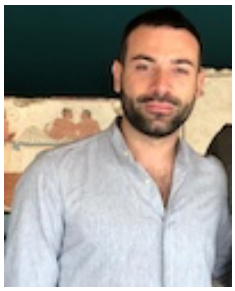
Dr Salvatore Fusco's *Curriculum Vitae*



1. PERSONAL INFORMATIONS

Name and Surname: Salvatore Fusco

Nationality: Italian

Date and place of birth: 2nd July 1985, Torre Annunziata (Napoli)

Work place: Department of Biotechnology, University of Verona

Email: salvatore.fusco@univr.it

ORCID unique identified: orcid.org/0000-0003-2928-3609

Web Pages: https://www.linkedin.com/in/salvatore-fusco-21219499/
https://www.researchgate.net/profile/Salvatore_Fusco
https://www.scopus.com/authid/detail.uri?authorId=8780303400

2. EDUCATION

2015 PhD degree in Biotechnology
Department of Biology, Polytechnic School of Basic Sciences,
University of Napoli Federico II, Italy. Supervisor: Professor Simonetta Bartolucci.
Thesis title: CRISPR-mediated antiviral defence in *Sulfolobus*: a versatile tool and a dangerous weapon for setting up safeguarded industrial bioprocesses

2011 Master degree in Biology
Department of General and Applied Biology, University of Napoli Federico II, Italy.
Supervisor: Professor Simonetta Bartolucci.
Final mark: 110/110, Summa cum Laude and Honours.
Thesis title: Elucidation of the virus-host relationship during the carrier stage: transcriptome analysis of the archaeon *Sulfolobus solfataricus* infected with the fusellovirus SSV1

2008 Bachelor degree in Biology
Department of General and Applied Biology, University of Napoli Federico II, Italy.
Supervisor: Professor Laura Fucci.
Final mark: 110/110, Summa cum Laude.
Thesis title: "Caratterizzazione del promotore prossimale del gene *plaud* in P. lividus"

3. PROFESSIONALIZING COURSE

2015 **Industrial Biotechnology for Lignocellulose Based Processes**
Department of Biology and Biological Engineering
Chalmers University of Technology, (Göteborg, SE)

4. PROFESSIONAL EXPERIENCES

02.2020 – to date **Senior Assistant Professor (Tenure-Track)**
Department of Biotechnology, University of Verona (ITA)

02.2017 – 04.2019 **Principal Investigator**
Department of Biology, Polytechnic School of Basic Sciences,
University of Napoli Federico II, Italy.
Project: "Thermostable Virion-linked Enzymes: robust virus particles as tailorable scaffolds for the immobilization of enzymes"

09.2015 – 08.2017 **Postdoc Research Associate**
Division of Industrial Biotechnology
Department of Biology and Biological Engineering
Chalmers University of Technology, (Göteborg, SE)
Projects:
-Harnessing cytochrome P450 for the bioconversion of lignin-derived phenolic compounds and *in situ* detoxification in biorefineries
-*Bacillus coagulans* as microbial cell factory for L-lactic acid production from agricultural and forestry waste
-Analysis of quantitative methods for assessing yeast cell concentrations in lignocellulosic media
-Empowering protein engineering strategies using the CRISPR-Cas system

03.2012 – 03.2015 **PhD student in Biotechnology**
Department of Biology, Polytechnic School of Basic Sciences,
University of Napoli Federico II, Italy.
Project: Exploitation of the CRISPR-Cas antiviral defence system: setting up the construction of Virus Insensitive Thermophilic Strains (VITSs) for applications in industrial workflows

10.2013 – 12.2013 **Visiting PhD student**
Danish Archaea Centre, Department of Biology
University of Copenhagen (Copenhagen, DK)

09.2010 – 07.2011 **Master student**
Department of Biology, Polytechnic School of Basic Sciences,
University of Napoli Federico II, Italy.
Project: Elucidation of the virus-host relationship during the carrier stage: transcriptome analysis of the archaeon *Sulfolobus solfataricus* infected with the fusellovirus SSV1

09.2009 – 09.2010 **Visiting Master student (Erasmus)**
Danish Archaea Centre, Department of Biology
University of Copenhagen (Copenhagen, DK)
Project: Whole transcriptome analysis of *Sulfolobus solfataricus* upon infection with two related viruses belonging to the *Fuselloviridae* family

5. TEACHING AND SUPERVISING ACTIVITIES

a) In-class and in-lab teaching activities

2020 –to date Course of "New frontiers in Biocatalysis" (UniVr)
Role of Dr Fusco: Coordinator and main lecturer
CFU: 6
Master's degree: Biotechnology for bioresources and sustainable development (LM-8)

2020 –to date Course of "Industrial Enzymology" (UniVr)
Role of Dr Fusco: Coordinator and main lecturer
CFU: 6
Master's degree: Biotechnology for bioresources and sustainable development (LM-8)

2017 – 2019 **Theory/Practical course in Cloning and expression of recombinant proteins" (UniNA)**
Course's main lecturer: Dr Patrizia Contursi
Role of Dr Fusco: Lecturer and in-lab coordinator of practical activities
Seminar: Discovery and Characterization of a Viral Transcription Regulator

2018 **Course for the Doctoral School of Biotechnology (UniNA)**
Course name: Extremophiles and Extremozymes: perspectives for industrial biotechnology
Role of Dr Fusco: Lecturer
Seminar: Thermostable virus-like particles as tailorable scaffolds for the immobilization of enzymes

2015 Theory/Practical course in Cloning and expression of recombinant proteins" (UniNA)

Course's main lecturer: Dr Patrizia Contursi
Role of Dr Fusco: Lecturer and in-lab coordinator of practical activities
Seminar: Discovery and Characterization of a Viral Transcription Regulator

2013 – 2014 Practical course (UniNA)

Course name: Applied Biochemistry and Protein Engineering
Course's main lecturer: Professor Simonetta Bartolucci
Role of Dr Fusco: In-lab coordinator of practical activities

b) Tutoring and co-relation activities

2018 – 2019 Tutoring of a Postdoc Researcher

Dr Fusco, as Principal Investigator of the project "TheViriozymes", has mentored a Postdoc Researcher (Dr Martina Aulitto, PhD) at Department of Biology, Polytechnic School of Basic Sciences, University of Napoli Federico II, Italy.

2017 – 2019 Tutoring and co-relation of Bachelor and Master students

Dr Fusco has been the lab mentor of a PhD student. Moreover, he has mentored a master and two bachelor students, and he was co-relator of their thesis, at Department of Biology, Polytechnic School of Basic Sciences, University of Napoli Federico II, Italy.

2015 – 2017 Tutoring PhD and Master students

Dr Fusco has been the lab mentor of a PhD student and a master student, at Division of Industrial Biotechnology, Department of Biology and Biological Engineering, Chalmers University of Technology, (Göteborg, SE).

2012 – 2015 Tutoring PhD and Master students

Dr Fusco has been the lab mentor of a visiting Danish PhD student. Moreover, he has mentored two Italian PhD students, six master and ten bachelor students. Dr Fusco has also been the co-relator of their thesis, at Department of Biology, Polytechnic School of Basic Sciences, University of Napoli Federico II, Italy.

2013 Tutoring of Master students

Dr Fusco has been the lab mentor of a visiting master student at the Danish Archaea Centre, University of Copenhagen, Copenhagen, DK.

6. SCIENTIFIC PRODUCTION

a) Article list

1. ***Fusco S**., *****Aulitto M., Iacobucci., Crocamo G., Pucci P., Bartolucci S., Monti M. & Contursi P. (**2020**). "The interaction between the F55 virus-encoded transcription regulator and the RadA host recombinase reveals a common strategy in Archaea and Bacteria to sense the UV-induced damage to the host DNA." **Biochimica et Biophysica Acta (BBA) - Gene Regulatory Mechanisms,** *In Press*. ***Equal contribution**

2. *****Aulitto M., ***Fusco S**., Franzén C.J., Strazzulli A., Moracci, M., Bartolucci S. & Contursi P. (**2019**). "Draft genome sequence of *Bacillus coagulans* MA-13: a thermophilic lactic acid producer from lignocellulose" **Microbiology Resource Announcements***,* 6;8(23) doi:10.1128/MRA.00341-19. ***Equal contribution**

3. *****Aulitto M., ***#Fusco S**., Nickel D., Bartolucci S., Contursi P. & **#**Franzén C.J. (**2019**). "Seed culture pre-adaptation of *Bacillus coagulans* MA-13 leads to better lactic acid fermentation performance in Simultaneous Saccharification and Fermentation." **Biotechnology for Biofuels,** 28;12:45. doi:10.1186/s13068-019-1382-2. ***Equal contribution - #Corresponding author**

4. *Aulitto M., ***Fusco S**., Limauro D., Fiorentino G., Bartolucci S. & Contursi P. (**2019**). "Galactomannan degradation by thermophilic enzymes: a hot topic for biotechnological applications". **World Journal of Microbiology and Biotechnology**. 30;35(2):32. doi:10.1007/s11274-019-2591-3. ***Equal contribution**

5. Roscetto E., Contursi P., Vollaro A., **Fusco S**., Notomista E. & Maria Rosaria Catania (**2018**). "Antifungal and anti-biofilm activity of the first cryptic antimicrobial peptide from an archaeal protein against *Candida* spp. clinical isolates". **Scientific Reports**, 4;8(1):17570. doi:10.1038/s41598-018-35530-0.

6. *Aulitto M., ***Fusco S**., Bartolucci S., Franzén C.J. & Contursi P. (**2017**). "*Bacillus coagulans* MA-13: a promising thermophilic and cellulolytic strain for the production of lactic acid from lignocellulosic hydrolysate." **Biotechnology for Biofuels**. 7;10:210. doi:10.1186/s13068-017-0896-8 ***Equal contribution**

7. Strazzulli, A., **Fusco, S**., Cobucci-Ponzano, B., Moracci, M. & Contursi, P. (**2017**). "Metagenomics of microbial and viral life in terrestrial geothermal environments." **Reviews in Environmental Science and Bio/Technology**, 16;3:425-454. doi: 10.1007/s11157-017-9435-0

8. *Gaglione R., *Pirone L., *Farina B., ***Fusco S**., Smaldone G., Aulitto M., Dell'Olmo E., Roscetto E., Del Gatto A., Fattorusso R., Notomista E., Zaccaro L., Arciello A., Pedone E. & Contursi P. (**2017**). "Insights into the anticancer properties of the first antimicrobial peptide from *Archaea*." **Biochimica et Biophysica Acta - General Subjects -** 1861(9):2155-2164. doi:10.1016/j.bbagen.2017.06.009. ***Equal contribution**

9. Aulitto M., **Fusco S**., Fiorentino G., Limauro D., Pedone E., Bartolucci S. & Contursi P. (**2017**). "*Thermus thermophilus* as source of thermozymes for biotechnological applications: homologous expression and biochemical characterization of an α-galactosidase." **Microbial cell factories**, 13;16(1):28. doi:10.1186/s12934-017-0638-4.

10. Notomista E., *Falanga A., ***Fusco S**., *Pirone L., *Zanfardino A., Galdiero S., Varcamonti M., Pedone E. & Contursi P. (**2015**). "The identification of a novel *Sulfolobus islandicus* CAMP-like peptide points to archaeal microorganisms as cell factories for the production of antimicrobial molecules." **Microbial cell factories**, 4;14:126. doi:10.1186/s12934-015-0302-9. ***Equal contribution**

11. **Fusco S**., She Q., Fiorentino G., Bartolucci S. & Contursi P. (**2015**). Unravelling the role of the F55 regulator in the transition from lysogeny to UV induction of *Sulfolobus* spindle-shaped virus 1." **Journal of Virology**, 89(12):6453-6461. doi:10.1128/JVI.00363-15.

12. **Fusco S**., Liguori R., Limauro D., Bartolucci S., She Q. & Contursi P. (**2015**). "Transcriptome analysis of *Sulfolobus solfataricus* infected with two related fuselloviruses reveals novel insights into the regulation of CRISPR-Cas system." **Biochimie**, 118:322-332. doi:10.1016/j.biochi.2015.04.006.

13. **Fusco S.**, Aulitto M., Bartolucci S & Contursi P. (**2015**). "A standardized protocol for the UV induction of *Sulfolobus* spindle-shaped virus 1." **Extremophiles**, 19(2):539-546. doi:10.1007/s00792-014-0717-y

14. Contursi, P., **Fusco, S**., Cannio, R. & She, Q. (**2014**). "Molecular biology of fuselloviruses and their satellites." **Extremophiles**, 18(3):473-489. doi:10.1007/s00792-014-0634-0.

15. Contursi P., Farina B., Pirone L., **Fusco S**., Russo L., Bartolucci S., Fattorusso R. & Pedone E. (**2014**). "Structural and functional studies of Stf76 from the *Sulfolobus islandicus* plasmid–virus pSSVx: a novel peculiar member of the winged helix–turn–helix transcription factor family." **Nucleic Acids Research**, 42(9):5993-6011. doi:10.1093/nar/gku215

16. Contursi, P., **Fusco, S**., Limauro, D. & Fiorentino, G. (**2013**). "Host and viral transcriptional regulators in Sulfolobus: An overview." **Extremophiles**, 17(6):881-895. doi:10.1007/s00792-013-0586-9

17. **Fusco S**., She Q., Bartolucci S. & Contursi P. (**2013**). "T_{lys}, a newly identified *Sulfolobus* spindle-shaped virus 1 transcript expressed in the lysogenic state, encodes a DNA-binding protein interacting at the promoters of the early genes." **Journal of Virology**, 87(10):5926-5936. doi:10.1128/JVI.00458-13

b1) Invited and/or selected speaker at International Conferences

1. **Fusco S**., Robust virus particles as suitable scaffolds for the immobilisation of enzymes for biorefinery applications. 12th International Congress on Extremophiles -Extremophiles2018- (**Selected oral presentation**). Ischia (Italy), 16th-20th September **2018**.

2. **Fusco S**., Provirus integration leads to CRISPR-mediated autoimmunity in *Sulfolobus solfataricus*. 59th Congress of the Italian Society of Biochemistry and Molecular Biology (SIB 2017) (**Selected oral presentation**). Caserta (Italy), 20th-22th September **2017**.

3. **Fusco S**., Structure, function and unexplored properties of fuselloviruses-encoded transcription factors. Molecular Biology of *Archaea* 4th conference (**Invited speaker**). Institute Pasteur, Paris (France), 19th-22th May **2014**.

b2) Other Conference Communications

1. **Fusco S**., Aulitto M., Iacobucci I., Bartolucci S., Pucci P., Monti M. & Contursi P. "Unravelling the Crosstalk Between the SSV1 Carrier State Regulator and the *Sulfolobus solfataricus* DNA Damage Surveillance Machinery". ASM Microbe 2019. San Francisco (CA, USA), 20th-25th June **2019.** (**Presenting author**).

2. Arciello A., Aulitto M., Bartolucci S., Del Gatto A., Dell'Olmo E., Falanga A., Farina B., Fattorusso R., **Fusco S**., Gaglione R., Galdiero S, Pirone L., Roscetto E., Vollaro A., Smaldone G., Zaccaro L., Zanfardino A., Catania M.R., Varcamonti M., Notomista E., Pedone E. & Contursi P." VLL-28 is a bioactive peptide from the *Archaea* kingdom showing antimicrobial, antifungal and antitumor activities". 12th International Congress on Extremophiles -Extremophiles 2018. Ischia (Italy), 16th-20th September **2018**.

3. Aulitto M., **Fusco S**., Bartolucci S. & Contursi P. "Thermophilic virus particles as scaffolds for enzymes immobilisation: the case of the *Sulfolobus* spindle-shaped virus 1". NanoInnovation 2018, book of abstracts and poster section. Rome (Italy), 11th-14th September **2018**.

4. **Fusco S**., Olsson H. & Carl Johan Franzén. "CRISPR/Cas9-assisted protein engineering". Cell Symposia - CRISPR: From Biology to Technology and Novel Therapeutics, book of abstracts and poster section. Sitges (Spain), 29th October- 1st November **2017**. (**Presenting author**).

5. **Fusco S**., Aulitto M., She Q., Bartolucci S. & Contursi P. "The archaeal lysogeny regulator F55: from discovery to *in vitro* and *in vivo* characterizations". 59° Congresso Società Italiana di Biochimica e Biologia Molecolare, book of abstracts and poster section. Caserta (Italy), 20th-22th September **2017**. (**Presenting author**).

6. Franzén C.J., Wang R., Nickel D., Olsson L., **Fusco S**., Aulitto M., Bartolucci S. & Contursi P. "High gravity lignocellulose bioprocess development for ethanol and lactic acid production by multi-feed simultaneous saccharification and fermentation". Recent Advances in Fermentation Technology, book of abstracts and poster section. Bonita Springs (FL, USA), 29th October – 1st November **2017.**

7. Wang R., **Fusco S.**, Lorantfy B., Olsson L. & Franzén CJ. "Which methods for viable yeast cell quantification can be used in lignocellulosic fermentation processes?". European Symposium on Biochemical Engineering Sciences (ESBES) 2016, book of abstracts and poster section. Dublin (Ireland), 11th-14th September **2016**.

8. Aulitto M., **Fusco S**., Fusco FA., Limauro D., Bartolucci S. & Contursi P. "A thermophilic *Bacillus coagulans* strain isolated from beans-waste is promising for cellulosic biomass saccharification". XXI IUPAC CHEMRAWN Conference, book of abstracts and poster section. Rome (Italy), 6th-8th April **2016**.

9. **Fusco S**., Notomista E., Arciello A., Falanga A., Gaglione R., Galdiero S., Pedone E., Pirone L., Varcamonti M., Zanfardino A. & Contursi P. "A powerful *in silico* approach allowed the identification of a new antimicrobial peptide from the third domain of life". Proteine2016, book of abstracts and poster section. Bologna (Italy), 30th March – 1st April **2016**. (**Presenting author**).

10. **Fusco S**., She Q., Bartolucci S. & Contursi P. "Exploring the lysogenic state of *Sulfolobus* spindle-shaped virus 1: the regulative role of the Ribbon-Helix-Helix viral protein F55". 10th International Congress on Extremophiles -Extremophiles2014-, book of abstracts and poster section. Saint Petersburg (Russia), 7th-11th September **2014**. (**Presenting author**).

11. Pirone L., Contursi P., Zanfardino A., **Fusco S**., Varcamonti M., Notomista E., Falanga A., Galdiero S. & Pedone E. "The identification and characterization of a novel CAMP from Stf76, a Sulfolobus islandicus plasmid-virus pSSVx transcription factor". 14th Naples Workshop on Bioactive Peptides: The renaissance era of peptides in drug discovery, book of abstracts and poster section. Napoli (Italy), 12th-14th June **2014**.

12. Pirone L., Contursi P., Farina B., **Fusco S**., Russo L., Bartolucci S., Fattorusso R. & Pedone E. "structural and functional studies of stf76 from the *Sulfolobus islandicus* plasmid–virus pssvx: a novel peculiar member of the winged helix–turn–helix transcription factor family". Proteine2014, book of abstracts and poster section. Padova (Italy) 31st March – 1st April **2014**.

13. **Fusco S**., She Q., Bartolucci S. & Contursi P. "F55: a putative lysogeny regulator of the fusellovirus SSV1". CMC Symposium 2013, book of abstracts. Copenhagen (Denmark), 4th October **2013**. (**Presenting author**).

14. **Fusco S**., She Q., Bartolucci S. & Contursi P. "p55, a newly identified Ribbon-Helix-Helix transcription factor encoded by SSV1: elucidation of archaeal host-virus interactions". Proteine2012, book of abstracts and poster section. Chieti (Italy), 25th-26th September **2012**. (**Presenting author**).

c) Main Research Activities

The research activities carried out by Dr Salvatore Fusco focus on the following topics:

1. Identification and characterization of enzymes for the enhancement of lignocellulosic biomass;

2. Isolation and characterization of microorganisms for industrial biotechnological applications;

3. Development of methods for the immobilization of enzymes on viral nanoparticles;

4. Development of innovative methods to facilitate the "library" screening of enzyme variants, generated by the direct evolution of enzymes;

5. Identification and characterization of bioactive peptides;

6. Functional and structural characterization of the viral proteins involved in the regulation of gene transcription

d) National and international collaborations: organization, management and coordination of national and international research groups or participation in them

a) **From 2015 to date**, Dr. Fusco collaborates with **Prof. Lisbeth Olsson** and **Prof. Carl Johan Franzén** at the **Division of Industrial Biotechnology** of the Department of Biology and Biological Engineering (**Chalmers University of Technology, Göteborg, SE**);

b) **From 2009 to today**, Dr. Fusco collaborates with the research group of **the Danish Archaea Center** led by **Prof. Qunxin She** at the **Department of Biology** (**University of Copenhagen, Copenhagen, DK**;

c) **From 2009 to today**, Dr. Fusco collaborates with **Prof. Simonetta Bartolucci** and P**rof. Patrizia Contursi**, at the laboratories of the **Department of Biology** of the **University of Naples Federico II**.

7. ABILITY TO ATTRACT FUNDING

02.2017 – 04.2019 **Young researchers grant**
Department of Biology, University of Naples Federico II (ITA) Project: Thermostable Virion-linked Enzymes: robust virus particles as tailorable scaffolds for the immobilization of enzymes
Project acronym: TheViriozymes
Amount of funding: 100,000 EUR
Financing bodies: Compagnia di San Paolo and University of Naples Federico II
Role of Dr. Fusco: Principal Investigator and Scientific Responsible

2020 – To date **Starting Grant**
Project: Department of Excellence 2018/2022
Location: Department of Biotechnology, University of Verona
Financing amount: 75,000 EUR
Funding body: Ministry of Education, University and Research (MIUR)

8. AWARDS

2014 **FEMS scholarship**
FEMS Young Scientist Meeting Grant 2014
10th International Congress on Extremophiles -Extremophiles2014-

2009 **Erasmus scholarship**
Danish Archaea Center
Department of Biology University of Copenhagen (Copenhagen, DK)

9. AFFILIATION WITH SCIENTIFIC SOCIETIES

2014 – To date **Young Member**
Italian Society of Biochemistry and Molecular Biology

10. PARTICIPATION IN EDITORIAL COMMITTEES OF INTERNATIONAL JOURNALS

06.2019 – to date **Member of the Editorial Board** (**Reviewer Editor**)
Journal: Frontiers in Microbiology
Section: Biology of Archaea

2014 – to date **Invited Reviewer**
Scientific Reports (Nature Publishing Group)
Biotechnology for Biofuels (Springer Nature, BCM)
Extremophiles (Springer Link)
Biocatalysis and Agricultural Biotechnology (Elsevier)
Journal of Cleaner Production (Elsevier).

Verona, 25 October 2020

Salvatore Fusco