

Curriculum Vitae

Personal information

Name: Maria Carolina Silva Ferreira

Date of birth: 23rd of July 1996

Nationality Portuguese

Address: Rua Isaac Rabin nº25, 1º Esquerdo, 1600-478 Lisboa

Phone: 962736224

E-mail: carolinaf@ihmt.unl.pt



Education

- **PhD in Biomedical Sciences (2020 – present)**

Instituto de Higiene e Medicina Tropical, Universidade Nova de Lisboa (IHMT-NOVA)

- **Dissertation theme:** “The staphylococcal effluxome: role in antimicrobial resistance and virulence”

Supervisor: Professor Isabel Couto

Co-supervisor: Doctor Sofia Santos Costa

IHMT-NOVA

Grant by Fundação para a Ciência e Tecnologia (FCT), ref 2021.05063.BD

- **Master’s Degree in Medical Microbiology (2017 - 2020)**

Universidade Nova de Lisboa

Final classification: 19/20

- **Dissertation theme:** "Resistance to biocides and topical antibiotics in *Staphylococcus aureus* of human origin"

Supervisor: Professor Isabel Couto

Co-supervisor: Doctor Sofia Santos Costa

IHMT-NOVA

Concluded in January 2020, grade: 19/20

- **Bachelor’s Degree in Cellular and Molecular Biology (2014-2017)**

Faculdade de Ciências e Tecnologia / Universidade Nova de Lisboa

Final classification: 17/20

Professional activity

January 2020 – July 2020 Research Assistant within project “BIOSAFE: Preventing antimicrobial resistance in the community – the safe use of biocides”. LISBOA-01-0145-FEDER-030713, PTDC/CAL- EST/30713/2017
Medical Microbiology Unit, IHMT-NOVA
Supervisor: Professor Isabel Couto

Internships

- Molecular Microbiology of Human Pathogens Lab, ITQB / Universidade Nova de Lisboa
 - *Streptococcus pneumoniae* genotyping by MLST
Supervisor: Professor Raquel Sá Leão
Co-supervisor: Carina Valente
January - February 2017
 - *S. pneumoniae* serotyping by real-time PCR
Supervisor: Professor Raquel Sá Leão
Co-supervisor: Sónia Almeida
June – July 2017
- Microbial Genetics Lab, Life Sciences Department / Faculdade de Ciências e Tecnologia / Universidade Nova de Lisboa
Cloning and expression of *msmK* gene of *Streptococcus pneumoniae*
Supervisor: Professor Isabel Sá Nogueira
June - July 2016

Laboratorial experience

Microbiology

- Manipulation of *Staphylococcus aureus* and *Streptococcus pneumoniae*
- Antibiotic and biocide susceptibility testing:
 - Disc diffusion method
 - Determination of minimum inhibitory concentration (MIC) by the microdilution method and E-test
- Evaluation of efflux activity:
 - Cartwheel-EtBr method
 - MIC determination with efflux inhibitors
 - MIC determination of ethidium bromide

- Determination of epidemiological cut-off values (ECOFFs) using the Normalized Resistance Interpretation (NRI) method and the Iterative Statistical Method with the programs "Automatic NRI disc diffusion V01β" and "ECOFFinder V2.0", respectively.
- Genetic manipulation:
 - Transduction of *S. aureus*
 - Transformation of *S. aureus* by electroporation and of *Escherichia coli* by the CaCl₂ method
 - Plasmid transfer by conjugation in *E. coli*
 - Cloning in *E. coli*

Molecular Biology

- Screening of antimicrobial resistance determinants by PCR and gene sequencing
- Plasmid characterization (isolation and analysis of restriction profiles) in *S. aureus*
- Genotyping by Multilocus sequence typing (MLST)
- Real-time PCR

Scientific communications

Articles in international peer-reviewed journals

1. **Ferreira C**, Costa SS, Serrano M, Oliveira K, Trigueiro G, Pomba C, Couto I. Clonal Lineages, Antimicrobial Resistance, and PVL Carriage of *Staphylococcus aureus* Associated to Skin and Soft-Tissue Infections from Ambulatory Patients in Portugal. *Antibiotics* (Basel). 2021;10(4):345. doi: 10.3390/antibiotics10040345.
2. Costa SS, **Ferreira C**, Ribeiro R, Feßler AT, Schink AK, Kadlec K, Kaspar H, Amaro A, Albuquerque T, Abrantes P, Morais C, Pomba C, Schwarz S, Couto I. Proposal of Epidemiological Cutoff Values for Apramycin 15 µg and Florfenicol 30 µg Disks Applicable to *Staphylococcus aureus*. *Microb Drug Resist.* 2021;27(11):1555-1559. doi: 10.1089/mdr.2020.0402.
3. Costa SS, Ribeiro R, Serrano M, Oliveira K, **Ferreira C**, Leal M, Pomba C, Couto I. *Staphylococcus aureus* Causing Skin and Soft Tissue Infections in Companion Animals: Antimicrobial Resistance Profiles and Clonal Lineages. *Antibiotics.* 2022; 11(5):599. <https://doi.org/10.3390/antibiotics11050599>

Communications in conferences

1. **Carolina Ferreira**, Sofia Santos Costa, Catarina Morais, Constança Pomba, Isabel Couto. 2019. Resistance to biocides and antibiotics in *Staphylococcus aureus* associated with SSTIs in ambulatory patients. P234, Book of Abstracts of the National Congress of Microbiology and Biotechnology, Microbiotec 2019, Coimbra (Portugal), 5 to 7 December 2019. Book of abstracts available at:
http://microbiotec19.net/test/wp-content/uploads/2019/07/Book_abstract_online.pdf
2. Sofia Santos Costa, Rute Ribeiro, Valéria Oliveira, Maria Serrano, **Carolina Ferreira**, Catarina Morais, Constança Pomba, Isabel Couto. 2020. Antibiotic and biocide resistance in staphylococci causing SSTIs in companion animals in Portugal. P2556, Book of Abstracts of the 30th European Congress of Clinical Microbiology and Infectious Diseases (ECCMID), Paris (France), 2020. Book of abstracts available at:
<https://markterfolg.de/ESCMID/Abstractbook2020.pdf>
3. Ketlyn Oliveira, Patrícia Abrantes, **Carolina Ferreira**, Rute Ribeiro, Maria Serrano, Constança Pomba, Isabel Couto, Sofia Santos Costa. 2021. Virulence traits of *Staphylococcus aureus* associated with skin and soft tissue infections in humans and animals. P249, Book of Abstracts of the National Congress of Microbiology and Biotechnology, Microbiotec 2021, Lisbon (Portugal), 23 to 26 November 2021. Book of abstracts available at:
<https://microbiotec21.organideia.pt/abstract-book/>
4. Marta Leal, Sofia Santos Costa, Bárbara Ramos, Catarina Morais, **Carolina Ferreira**, Constança Pomba, Isabel Couto. Evaluation of efflux activity in *Staphylococcus pseudintermedius* and its for biocide decreased susceptibility. P52, Book of Abstracts of the National Congress of Microbiology and Biotechnology, Microbiotec 2021, Lisbon (Portugal), 23 to 26 November 2021. Book of abstracts available at:
<https://microbiotec21.organideia.pt/abstract-book/>
5. **Carolina Ferreira**, Sofia Santos Costa, Patrícia Abrantes, Miguel Viveiros, Isabel Couto. Rapid screening of *norA* alleles among *Staphylococcus aureus* strains causing SSTIs in different hosts. P0449, 32nd European Congress of Clinical Microbiology and Infectious Diseases (ECCMID), Lisbon (Portugal), 23 to 26 April 2022.
6. Sofia Santos Costa, **Carolina Ferreira**, Catarina Morais, Patrícia Abrantes, Constança Pomba, Isabel Couto. Emergence of staphylococcal non-wild-type populations to biocides in a One Health perspective: are there reasons for concern? 00466, 32nd European Congress of Clinical Microbiology and Infectious Diseases (ECCMID), Lisbon (Portugal), 23 to 26 April 2022.
7. Marta Leal, Sofia Santos Costa, Bárbara Ramos, Catarina Morais, **Carolina Ferreira**, Constança Pomba, Isabel Couto. Efflux and biocide reduced susceptibility in *Staphylococcus pseudintermedius*. P0787, 32nd European Congress of Clinical Microbiology and Infectious Diseases (ECCMID), Lisbon (Portugal), 23 to 26 April 2022.

Other activities

- Participation as demonstrator in the European Researchers Night with the activity “Antimicrobial resistance: the role of biocides and a new weapon against superbugs” (September, 2019)
- Participation as demonstrator in the International Microorganism Day with the activity “Antimicrobial resistance: the role of biocides and a new weapon against superbugs” (September, 2019)
- Participation as demonstrator in the IHMT-NOVA Open Day (March, 2019)
- Participation in the Summer Science @ ITQB NOVA in the Applied and Environmental Mycology Lab with the work: “Protein profile analysis of FarA and FarB mutants of *Aspergillus nidulans*” (25 to 29 July 2016).
- Participation as demonstrator in the FCT-NOVA Open Day (April, 2016)

Master's Degree Certificate



CERTIDÃO/CERTIFICATE

Mónica Diana Salgueiro Faustino Sardo Belchior, Chefe da Divisão Académica da Faculdade de Ciências Médicas|NOVA Medical School da Universidade NOVA de Lisboa, CERTIFICA que do registo número 54/2020, consta que **MARIA CAROLINA SILVA FERREIRA**, com o Cartão de Cidadão n.º 14213988, emitido em Portugal, concluiu nesta Faculdade o **Mestrado em Microbiologia Médica** (uma colaboração entre a Faculdade de Ciências Médicas | NOVA Medical School, a Faculdade de Ciências e Tecnologia, o Instituto de Higiene e Medicina Tropical e o Instituto de Tecnologia Química e Biológica António Xavier da Universidade NOVA de Lisboa), com 120 ECTS, tendo sido aprovada com a classificação final de 19 (Dezanove) Valores, em 2020-01-13, pelo que lhe é conferido o grau de **Mestre em Microbiologia Médica**.

*Mónica Diana Salgueiro Faustino Sardo Belchior, Head of Academic Division of the Faculdade de Ciências Médicas|NOVA Medical School of NOVA University Lisbon, hereby CERTIFIES that, according to the official record number 54/2020, **MARIA CAROLINA SILVA FERREIRA**, Citizen Card number 14213988, issued in Portugal, has successfully completed the **Master Degree in Medical Microbiology** (a collaboration between Faculdade de Ciências Médicas | NOVA Medical School, Faculdade de Ciências e Tecnologia, Instituto de Higiene e Medicina Tropical and Instituto de Tecnologia Química e Biológica António Xavier of NOVA University Lisbon), with 120 ECTS, at this School, with a final classification of 19/20* (Nineteen), on 2020-01-13, being awarded the **Master Degree in Medical Microbiology**.*

(*)The grading scale used at the Faculdade de Ciências Médicas|NOVA Medical School ranges from 0 to 20 (10 points is considered the threshold pass grade).

Faculdade de Ciências Médicas|NOVA Medical School – NOVA University Lisbon, February 13, 2020.

Dra. Mónica Diana Salgueiro Faustino Sardo Belchior
Chefe da Divisão Académica / Head of Academic Division

Em.º da cert. / Certificate Tax: 50,00€

Urgência / Urgent: 0,00€

Total / Total: 50,00€

Conferido / Conf. by:

2017492

A presente vai firmada com o selo branco desta faculdade, / This document is only valid if signed and authenticated by the embossed seal of the School.

Master's Degree Certificate



CERTIFICATE

Mónica Diana Salgueiro Faustino Sardo Belchior, Head of Academic Division of the Faculdade de Ciências Médicas | NOVA Medical School of NOVA University Lisbon, hereby CERTIFIES that **MARIA CAROLINA SILVA FERREIRA**, Citizen Card number 14213988, issued in Portugal, has successfully completed* the following Curricular Units of the **Master Degree in Medical Microbiology** (a collaboration between Faculdade de Ciências Médicas | NOVA Medical School, Faculdade de Ciências e Tecnologia, Instituto de Higiene e Medicina Tropical and Instituto de Tecnologia Química e Biológica António Xavier of NOVA University Lisbon):

Course	Academic Year	Grade	Grade in Detail	Course Year	ECTS
Introduction to Microbiology, Microbial Genetics and Recombinant DNA Technology	2017/18	19	Nineteen	1	6
Immunity and Infection	2017/18	18	Eighteen	1	2
Medical Bacteriology	2017/18	18	Eighteen	1	7
Medical Virology	2017/18	19	Nineteen	1	7
Introduction to Medical Mycology	2017/18	20	Twenty	1	2
Prevention and Therapy of Infectious Diseases	2017/18	19	Nineteen	1	2
Theory and Methods in Epidemiology and Biostatistics	2017/18	19	Nineteen	1	2
Bioethics, Laboratory Safety and Quality Assurance	2017/18	20	Twenty	1	2
Optional II: Molecular Biology and Epidemiology of Gram-positive pathogenic bacteria	2017/18	19	Nineteen	1	6
Optional I: Tuberculosis and Atypical Mycobacteria	2017/18	18	Eighteen	1	6
Optional III: Mechanisms of Resistance to Antibiotics	2017/18	19	Nineteen	1	6
Optional IV: Medical Importance of Zoonotic Spirochetes: Leptospira and Borrelia	2017/18	19	Nineteen	1	6
Optional V: Transferências Génicas e Tecnologia do DNA Recombinante em Procariontes e Eucariontes	2017/18	19	Nineteen	1	6
Thesis / Research Project	2018/19	19	Nineteen	2	60

(*The grading scale used at the Faculdade de Ciências Médicas|NOVA Medical School ranges from 0 to 20 (10 points is considered the threshold pass grade).

Faculdade de Ciências Médicas | NOVA Medical School – NOVA University Lisbon, on February 13, 2020.

Dra. Mónica Diana Salgueiro Faustino Sardo Belchior
Head of Academic Division

Certificate Tax: 15,10€

Urgent: 0,00€

Total: 15,10€

Conf. by:

2017492

This document is only valid if signed and authenticated by the embossed seal of the School.

Bachelor's degree Certificate



Universidade Nova de Lisboa
Faculdade de Ciências e Tecnologia

CERTIDÃO/CERTIFICATE

Isabel Maria Dimas Cardoso Sequeira Pinto, Chefe da Divisão Académica da Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa, certifica que **Maria Carolina Silva Ferreira**, portadora do Cartão de Cidadão nº 14213988, estudante nº 45564, concluiu em 19/6/2017, o **curso de Licenciatura em Biologia Celular e Molecular (1º Ciclo - 180 ECTS)** desta Faculdade, com a classificação final de **17 (dezasete) valores**, numa escala de 0-20 (A no sistema de classificação ECTS), o que lhe confere o **Grau de Licenciado em Biologia Celular e Molecular**, tendo obtido aproveitamento nas seguintes unidades curriculares:

*Isabel Maria Dimas Cardoso Sequeira Pinto, Head of Academic Division of the Faculdade de Ciências e Tecnologia (Faculty of Science and Technology) of Universidade Nova de Lisboa, hereby certifies that **Maria Carolina Silva Ferreira**, holder of Citizen Card No. 14213988, student No. 45564, on 19/6/2017 has fulfilled the requirements of the **Bachelor Program in Molecular and Cellular Biology (1st Cycle - 180 ECTS)** of this Faculty, with the final mark of **17 (seventeen)** on a scale of 0-20 (A on the ECTS grading system), which awards her the **Bachelor Degree in Molecular and Cellular Biology**, upon completion of the following courses:*

Unidades curriculares Courses	Credits ECTS	Nota(*) Mark	ECTS Grade	Data Date
Introdução à Biologia <i>General Biology</i>	6	16	B	2014-12-13
Técnicas de Laboratório em Biologia I <i>Biology Laboratory Techniques I</i>	3	15	B	2014-12-15
Introdução à Química da Vida <i>Chemistry of Life</i>	6	17	B	2014-12-17
Química Geral <i>General Chemistry</i>	6	17	A	2014-12-19
Matemática para Biologia <i>Mathematics for Biology</i>	6	16	B	2014-12-31
Competências Transversais para Ciências e Tecnologia <i>Soft Skills for Science and Technology</i>	3	17	B	2015-02-20
Química Orgânica Geral A <i>General Organic Chemistry A</i>	6	16	C	2015-06-06
Informática para Ciências e Engenharias B <i>Informatics for Science and Engineering B</i>	6	18	A	2015-06-11
Probabilidades e Estatística C <i>Probability and Statistics C</i>	6	16	B	2015-06-15
Bioquímica Geral A <i>General Biochemistry A</i>	6	17	B	2015-06-16
Biologia Animal <i>Animal Biology</i>	6	19	A	2015-12-11
Metabolismo e Regulação <i>Metabolism and Regulation</i>	6	17	B	2015-12-14
Biologia Celular A <i>Cell Biology A</i>	6	17	A	2015-12-19
Fundamentos de Ecologia <i>Fundamentals of Ecology</i>	6	17	A	2016-01-05
Ciência, Tecnologia e Sociedade <i>Science, Technology and Society</i>	3	19	B	2016-03-05
Biologia Molecular A <i>Molecular Biology A</i>	6	16	C	2016-06-04

Maria Carolina Silva Ferreira

Pag. 1



Bachelor's degree Certificate



Universidade Nova de Lisboa
Faculdade de Ciências e Tecnologia

(continuação / continued from previous page)

Unidades curriculares <i>Courses</i>	Credits ECTS	Nota(*) <i>Mark</i>	ECTS Grade	Data <i>Date</i>
Microbiologia B <i>Microbiology B</i>	6	18	A	2016-06-07
Técnicas de Laboratório em Biologia II <i>Laboratory Techniques in Biology II</i>	6	17	B	2016-06-09
Bio-Segurança e Bioética <i>Biosafety and Bioethics</i>	3	19	A	2016-06-12
Biologia Vegetal <i>Plant Biology</i>	6	18	A	2016-06-14
Termodinâmica B <i>Thermodynamics B</i>	6	19	A	2016-10-17
Introdução à Biofísica A <i>Introduction to Biophysics A</i>	6	16	B	2016-10-17
Genética Molecular A <i>Molecular Genetics A</i>	6	15	A	2016-12-16
Bioinformática <i>Bioinformatics</i>	6	16	B	2016-12-19
Imunologia <i>Immunology</i>	6	17	B	2016-12-21
Virologia <i>Virology</i>	6	17	B	2016-12-28
Engenharia de Células e Tecidos <i>Cell and Tissue Engineering</i>	6	17	B	2017-01-20
Programa de Introdução à Investigação Científica <i>Undergraduate Research Opportunity Program</i>	3	20	A	2017-04-18
Biotecnologia <i>Biotechnology</i>	6	17	A	2017-06-07
Toxicologia Alimentar <i>Food Toxicology</i>	6	18	B	2017-06-08
Engenharia Genética <i>Genetic Engineering</i>	6	18	A	2017-06-12
Fisiologia <i>Physiology</i>	6	18	A	2017-06-16
Seminário <i>Seminar</i>	3	19	A	2017-06-19

(*) Escala/Scale: 0-20

O estudante realizou ainda nesta Faculdade as seguintes unidades extracurriculares:

The student also completed in this Faculty the following extracurricular courses:

Unidades extracurriculares <i>Courses</i>	Credits ECTS	Nota(*) <i>Mark</i>	ECTS Grade	Data <i>Date</i>
Física II <i>Physics II</i>	6	19	A	2015-12-09
Introdução à Biofísica <i>Introduction to Biophysics</i>	6	16	B	2015-06-01

Maria Carolina Silva Ferreira

Pag. 2



Bachelor's degree Certificate



Universidade Nova de Lisboa
Faculdade de Ciências e Tecnologia

(*) Escala/Scale: 0-20



FCT-UNL, 25 de Julho de 2017

A Chefe de Divisão Académica / Head of Academic Division,

Nº Registo: 635L/2017
Emitido por: Susana
Conferido por: Carla
Emolumentos: 73,10 €

Maria Carolina Silva Ferreira

Pag. 3

