

Elena De Vita, PhD



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🌍 **Nationality:** Italian

About me

I am a Medicinal Chemist by training and at heart, with a well-rounded understanding and interdisciplinary expertise at the interface of Chemistry and Chemical Biology. My specific background endows me with the ability to effectively work with experts in different fields of Chemistry and Biology, as well as to guide students in both disciplines. With the fast development of technology and knowledge at the confluence of Chemistry and Biology, it is becoming clear that the future of Medicinal Chemistry in academia will require leading figures with a strong understanding at the interface of both disciplines. Aspiring to belong to this selected group of high-profile scientists, I am determined to become a leader in the resurgent topic of covalent inhibitors and to study novel therapeutic modalities such as PROteolysis Targeting Chimeras (PROTACs) and other heterobifunctional molecules. I look forward to inspiring the minds of future scientists by conducting cutting-edge research in the fascinating field of Medicinal Chemistry.

WORK EXPERIENCE

Marie Skłodowska-Curie Fellow

01/08/2020 – PRESENT – Imperial College London, London, United Kingdom

Leader of a medicinal chemistry team for the discovery of covalent inhibitors of small GTPases. [Main project]¹

- Management of project priorities, grant applications and collaborations.
- Management of the team working on the project, including supervision of PhD and MRes's students.
- Drug discovery, high-throughput screening, hit identification, hit-to-lead optimisation, molecular docking, organic synthesis, protein production and purification, chemical biology, targeted-protein degradation, cell-based assays, proteomics.

Additionally, I lead and support a range of interdisciplinary projects (e.g., heterobifunctionals, chemical biology methodologies) and collaborations.⁴⁻⁸

BBSRC Flexible Talent Mobility Account

01/01/2022 – 31/03/2022 – Imperial College London/MSD, London, United Kingdom

Development of dephosphorylating heterobifunctional molecules in collaboration with MSD (Merck), including secondment time at the Francis Crick Institute in London.

Consultancy for the 2022 Merck Innovation Cup

15/11/2021 – 31/12/2022 – Merck KGaA, Darmstadt, Germany

Selected as a coach for the team Autoimmunity to support the preparation of an innovative and competitive pitch.

CRUK Research Associate in Medicinal Chemistry

07/01/2019 – 31/07/2020 – Imperial College London, London, United Kingdom

Working in a medicinal chemistry team for the discovery of covalent inhibitors of small GTPases.^{1,4-8}

- Drug discovery, organic synthesis, molecular docking, protein production and purification, biochemical assays, chemical biology, cell-based assays.

PhD student

04/02/2015 – 28/12/2018 – German Cancer Research Center (DKFZ), Heidelberg, Germany

Developing small molecule covalent inhibitors against Kallikrein-related peptidase 6 (KLK6).^{2,9,11-14}

- Medicinal chemistry, organic synthesis, biochemical assays, mass spectrometry, cell-based assays.

Project funded by DKFZ-MOST, the German-Israeli Cooperation in Cancer Research.

Visiting scientist

07/01/2018 – 18/03/2018 – Imperial College London, London, United Kingdom

Validation of activity-based probes against Kallikrein-related peptidase 6.¹²

Visiting scientist

01/02/2016 – 01/04/2016 – EMBL, Heidelberg, Germany

Protein production and purification.¹²

EDUCATION

PhD in Pharmaceutical Chemistry

04/02/2015 – 18/11/2018 – German Cancer Research Center (DKFZ)/University of Heidelberg, Heidelberg, Germany [Magna cum Laude]

Thesis title: *Small molecule KLK6 inhibitors*.^{2,9,12–14} Supervisor: Dr A. K. Miller, Prof Dr C. D. Klein

M.Sc in Pharmaceutical Chemistry and Technologies (B.Sc+M.Sc equivalent)

01/10/2009 – 14/10/2014 – Department of Pharmacy, University of Pisa, Pisa, Italy [110/110 cum Laude]

Thesis title: *Synthesis and inhibitory properties of carboxylate-based inhibitors and their fluorescent-labelled analogues with high affinity for some Metzincins*.^{3,10} Supervisor: Prof Armando Rossello

HONOURS AND AWARDS

BBSRC Flexible Talent Mobility Account

01/01/2022 – 31/03/2022 – Imperial College London/MSD, London, United Kingdom

This is a BBSRC awarded internal scheme at Imperial College to promote the development of early-career scientists sponsoring secondments with industrial exchange. Award: £20,972.00

Co-Investigator for the project “Covalent small molecules targeting Rab27 to block cancer metastasis” funded by Worldwide Cancer Research (22-0170)

01/03/2022 – 01/03/2025 – Imperial College London, London, United Kingdom

This is an international yearly-awarded grant to support cancer research. Our proposal is based on the current data generated in my main project and has received very positive feedback from reviewers. Award: £ 217,531.00

Winner of the 2021 Merck Innovation Cup

02/07/2021 – Merck KGaA, Darmstadt, Germany

As part of the Drug Discovery Technologies team, I contributed to develop an initial scientific idea on molecular glues into a structured pitch for innovative applications in Drug Discovery, awarded first place in the Cup. Prize: € 20,000.00

Marie Skłodowska-Curie Fellowship (H2020 MSCA-IF 890900, RabTarget4Metastasis)

01/08/2020 – 01/08/2022 – Imperial College London, London, United Kingdom

This is a competitive fellowship granted from the European Commission to support my research. Award: € 224,933.76

GDCh Doctoral prize for Medicinal Chemistry

27/03/2019 – Gesellschaft Deutscher Chemiker (GDCh), Germany

Awardee of the Medicinal Chemistry Doctoral Prize (Promotionspreise Medizinische Chemie). Prize: € 500.00

EMBO short term fellowship (STF-7471)

15/01/2019 – European Molecular Biology Organization (EMBO)

Fellowship to support a 2-month research visit to the laboratory of Prof Tate at Imperial College London. Project: validation of activity-based probes (ABPs) for Kallikrein-related peptidase 6 (KLK6). Award: € 5,737.52

Excellence award

14/10/2014 – University of Pisa, Italy

Granted upon successful completion of a merit-based parallel course to promote development of high-profile students. Eligibility: timely study progression with an average score of 27/30 or above, and no grade below 25/30, plus extracurricular courses and examinations. Award: ~€ 1,000.00/year, Excellence Award at graduation.

TEACHING

Supervision of 1 undergraduate, 7 MRes students, 2 PhD students

07/01/2019 – PRESENT – Imperial College London, London, United Kingdom

Duties: project proposal preparation, support to project design and development, proofreading of reports, support in career development, marking of reports and participation in viva discussion as internal examiner.

Member of the UCAS interview panel for the selection of Imperial undergraduates

06/11/2019 – 26/02/2020 – Imperial College London, London, United Kingdom

Duties: conducting interviews (Organic Chemistry) and marking of the candidates' interviews.

DKFZ Summer Internship Program

01/08 – 30/09/2016 – German Cancer Research Center (DKFZ), Heidelberg, Germany

I participated in the program, selected a Master student (currently a PhD student at University of British Columbia, Vancouver) and structured a suitable project including organic synthesis and biochemical assays within the remit of my PhD project. I supervised the student in the lab and supported her in the delivery of results.

Three tutorship assignments for the course of Animal Biology

01.09.2012–31.07.2014 (3 months each, with interruptions) – Department of Pharmacy, University of Pisa, Pisa, Italy

Duties: preparation of lecture materials, marking of written exams.

Tutorship assignment for the course of Analytical Chemistry

01.09.2013–31.12.2013 – Department of Pharmacy, University of Pisa, Pisa, Italy

Duties: preparation of lecture materials, support to students.

NETWORK AND MEMBERSHIPS

Early-Career Researcher Taskforce

17/12/2020– PRESENT – Biochemical Society/Portland Press, United Kingdom

Early Career Member of the Biochemical Society

01/04/2020– PRESENT – Biochemical Society, United Kingdom

Early Career Panel Member

12/02/2020– PRESENT – Future Medicinal Chemistry Journal, United Kingdom

CONFERENCES

(selected)

GDCh PhD Prize winner short talk, Title: *Small Molecule Inhibitors of Kallikrein-related Peptidase 6*

24–27.03.2019 – Frontiers in Medicinal Chemistry meeting, Würzburg, Germany.

Invited talk, Title: *Development and characterization of small molecule KLK6 inhibitors*

26–27.04.2018 – 2nd Helmholtz Drug Discovery Conference (HDDC), Munich, Germany.

Poster presentation + invited “Breaking News” short talk, Title: *Discovery of KLK6 small molecule inhibitors*

26–29.09.2017 – 17th International Symposium on Kallikreins and kallikrein-related peptidases, Tours, France.

OUTREACHING AND REVIEWING ACTIVITIES

Reviewing activity

03.2019–PRESENT

Reviewer for scientific publications in scientific journals, including Trends in Pharmacological Sciences, Cell Press, ACS Publications. Reviewer for grant applications for the National Science Centre, Poland.

CRUK Revealing Research – a Supporters’ Day

23.03.2019 – CRUK London, United Kingdom

Research Open Days

10–11.04.2014 – University of Pisa, Italy

PUBLICATIONS AND PATENTS

(chronological)

1. M. Jamshidiha, T. Lanyon-Hogg, C. L. Sutherell, G. B. Craven, M. Tera, [E. De Vita](#), D. Brustur, I. Pérez-Dorado, S. Hassan, R. Petracca, R. M. Morgan, M. Sanz-Hernández, J. C. Norman, A. Armstrong, D. J. Mann, E. Cota, E. W. Tate, Identification of the first structurally validated covalent ligands of the small GTPase RAB27A, *RSC Med Chem*, **2021**, *Accepted*.
2. H. Yoon, E. M. Triplet, W. L. Simon, C-I. Choi, L. S. Kleppe, [E. De Vita](#), A. K. Miller, I. A. Scarisbrick, Blocking Kallikrein 6 promotes developmental myelination, *Glia*, **2021**, 1–21.
3. S. Santamaria, F. Buemi, E. Nuti, D. Cuffaro, [E. De Vita](#), T. Tuccinardi, A. Rossello, S. Howell, S. Mehmood, A. P. Snijders, and R. de Groot, Development of a fluorogenic ADAMTS-7 substrate, *J. Enzyme Inhib. Med. Chem.*, **2021**, 36 (1), 2160–2169.
4. [E. De Vita](#), D. Lucy, E. W. Tate, Beyond targeted protein degradation: LD-ATTECs clear cellular lipid droplets, *Cell Res.*, **2021**, 31, 945–946.
5. S. Lovell, L. Zhang, T. Kryza, A. Neodo, N. Bock, [E. De Vita](#), E. D. Williams, E. Engelsberger, C. Xu, A. T. Bakker, M. Maneiro, R. J. Tanaka, C. L. Bevan, J. A. Clements, and E. W. Tate, A Suite of Activity-Based Probes To Dissect the KLK Activome in Drug-Resistant Prostate Cancer, *J. Am. Chem. Soc.*, **2021**, 143, 8911–8924.
6. M. Maneiro, [E. De Vita](#), D. Conole, C. S. Kounde, Q. Zhang, E. W. Tate, PROTACs, molecular glues and bifunctionals from bench to bedside: Unlocking the clinical potential of catalytic drugs, *Prog. Med. Chem.*, **2021**, 60, 67–190.
7. [E. De Vita](#), 10 years into the resurgence of covalent drugs, *Fut. Med. Chem.*, **2020**, 13, 193–210.
8. [E. De Vita](#), M. Maneiro, E. W. Tate, The Missing Link between (Un)druggable and Degradable KRAS, *ACS Cent. Sci.*, **2020**, 6, 1281–1284.

9. [E. De Vita](#), N. Smits, H. van den Hurk, E. M. Beck, J. Hewitt, G. Baillie, E. Russell, A. Pannifer, V. Hamon, A. Morrison, S. P. McElroy, P. Jones, N. A. Ignatenko, N. Gunkel, A. K. Miller, Synthesis and Structure-Activity Relationships of N-(4-Benzamidino)-Oxazolidinones: Potent and Selective Inhibitors of Kallikrein-Related Peptidase 6, *ChemMedChem*, **2020**, 15, 79–95.
10. F. D’Andrea, E. Nuti, S. Becherini, D. Cuffaro, E. Husanu, C. Camodeca, [E. De Vita](#), M. R. Zocchi, A. Poggi, C. D’Arrigo, V. Cappello, M. Gemmi, S. Nencetti, C. Chiappe, A. Rossello, Design and synthesis of ionic liquid-based Matrix Metalloproteinase Inhibitors (MMPIs): a simple approach to increase hydrophilicity and to develop MMPI-coated gold nanoparticles, *ChemMedChem*, **2019**, 14, 686–698.
11. R. Longuespée, A. K. Wefers, [E. De Vita](#), A. K. Miller, D. E. Reuss, W. Wick, C. Herold-Mende, M. Kriegsmann, P. Schirmacher, A. von Deimling, S. Pusch, Rapid detection of 2-hydroxyglutarate in frozen sections of IDH mutant tumors by MALDI-TOF mass spectrometry, *Acta Neuropathol. Commun.*, **2018**, 6, Article number: 21.
12. [E. De Vita](#), P. Schüler, S. Lovell, J. Lohbeck, S. Kullmann, E. Rabinovich, A. Sananes, B. Heßling, V. Hamon, N. Papo, J. Hess, E. W. Tate, N. Gunkel, A. K. Miller, Depsipeptides featuring a neutral P1 are potent inhibitors of kallikrein-related peptidase 6 with on-target cellular activity, *J. Med. Chem.*, **2018**, 61, 8859–8874.
13. A. Sananes, I. Cohen, A. Shahar, A. Hockla, [E. De Vita](#), A. K. Miller, E. S. Radisky, N. Papo, A potent, proteolysis-resistant inhibitor of kallikrein-related peptidase 6 (KLK6) for cancer therapy, developed by combinatorial engineering, *J. Biol. Chem.*, **2018**, 33, 12663–12680.
14. A. K. Miller, P. Schüler, [E. De Vita](#), N. Gunkel, Chemical substances which inhibit the enzymatic activity of human kallikrein related peptidase 6 (KLK6), **2017**, WO2018065607.

SKILLS

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| <i>Organisational</i> | <ul style="list-style-type: none"> • Multi-tasking, pro-active and efficient workflow planning • Efficient and creative problem-solving skills, with goal-oriented mindset • Comfortable working under tight deadlines, including prioritising tasks effectively | | | | | | | | | | | | | | | | | | |
| <i>Communication and Interpersonal</i> | <ul style="list-style-type: none"> • Team player, pro-active collaborator, flexible, reliable • Excellent presentation skills, professional scientific writing for grant application and article publication, engaging communicator | | | | | | | | | | | | | | | | | | |
| <i>Management and Leadership</i> | <ul style="list-style-type: none"> • Supervision of team workers and students toward project goals • Daily decision-making and management of team workload (with direct reporting to principal investigator) | | | | | | | | | | | | | | | | | | |
| <i>Digital</i> | Microsoft Office / Social Media / Google Drive / Zoom / Skype / Teams / Latex / Photoshop / Chemdraw / Chimera / Graphpad-Prism / Max-Quant / Perseus / Biorender | | | | | | | | | | | | | | | | | | |
| <i>Languages</i> | <table border="0" style="width: 100%;"> <tr> <td>Italian</td> <td>● ● ● ● ●</td> <td><i>native</i></td> <td>English</td> <td>● ● ● ● ●</td> <td><i>C2</i></td> </tr> <tr> <td>German</td> <td>● ● ● ● ●</td> <td><i>B1/B2</i></td> <td>Japanese</td> <td>● ● ● ● ●</td> <td><i>A2/B1</i></td> </tr> <tr> <td>French</td> <td>● ● ● ● ●</td> <td><i>A2</i></td> <td></td> <td></td> <td></td> </tr> </table> | Italian | ● ● ● ● ● | <i>native</i> | English | ● ● ● ● ● | <i>C2</i> | German | ● ● ● ● ● | <i>B1/B2</i> | Japanese | ● ● ● ● ● | <i>A2/B1</i> | French | ● ● ● ● ● | <i>A2</i> | | | |
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| German | ● ● ● ● ● | <i>B1/B2</i> | Japanese | ● ● ● ● ● | <i>A2/B1</i> | | | | | | | | | | | | | | |
| French | ● ● ● ● ● | <i>A2</i> | | | | | | | | | | | | | | | | | |

HOBBIES AND INTERESTS

Singing, Japanese and Korean culture, study of foreign languages, travelling.