





# Dr. Andrea E. Prota

SENIOR SCIENTIST

## CONTACT INFO

 Paul Scherrer Institut  
Center for Life Sciences (CLS)  
Laboratory of Biomolecular  
Research  
Forschungsstrasse 111  
5232 Villigen PSI  
Switzerland

 +41 56 310 5160

 andrea.prota@psi.ch

 <https://www.psi.ch/en/lbr>

## LANGUAGE

Italian: Native  
German: Native  
English: Excellent  
French: Excellent  
Spanish: Satisfactory

## MAJOR RESEARCH INTREREST


Cancer research  
Neurodegeneration  
Tubulin biology  
Protein interactions  
X-ray crystallography  
Cryo-EM  
Drug discovery

## MEMBERSHIP

American Society for Virology  
Swiss Society for Molecular and  
Cellular Biosciences (SSMCB)

## MORE ABOUT ME

Web of Science ID

 R-9526-2019

ORCID-ID

 0000-0003-0875-5339

LinkedIn

 /andrea-prota-309b09105/

## EXECUTIVE SUMMARY

I am tenured senior scientist in the Laboratory of Biomolecular Research at the Paul Scherrer Institut (LBR) with long-standing expertise in tubulin structural biology, bacterial and mammalian protein expression, protein biochemistry, X-ray crystallography and drug discovery. I have authored 75 publications in this field and mentored and trained numerous students and laboratory personnel. In recognition of my expertise, I manage several research projects involving collaborations with national and international academic and industrial scientists who seek my expertise in the field of tubulin structural biology/tubulin-drug interactions, as elucidated by X-ray crystallography and cryo-EM.

## PROFESSIONAL EXPERIENCE

SENIOR SCIENTIST 2004 - Present  
*Paul Scherrer Institut, Villigen PSI, Switzerland*

## EDUCATION AND TRAINING

POSTDOCTORAL FELLOW 2002 - 2004  
*Paul Scherrer Institut, Villigen PSI, Switzerland*  
Topic: Structural biology, tumor angiogenesis, DNA mismatch repair

POSTDOCTORAL FELLOW 2000 - 2002  
*Beth Israel Deaconess Medical Center,  
Massachusetts General Hospital &  
Harvard Medical School, Boston, MA (USA)*  
Topic: Structural biology, virology

GRADUATE STUDENT IN PHARMACEUTICAL CHEMISTRY 1996 - 1999  
*ETH Zürich, Switzerland*  
Degree: Dr. sc. nat. ETH (Ph.D.)

UNDERGRADUATE STUDENT IN PHARMACEUTICAL SCIENCES 1989 -1995  
*ETH Zürich, Switzerland*  
Degree: Eidg. Staatsexamen (Apotheker)

HIGH SCHOOL 1985 -1989  
*Kantonsschule Baden, Switzerland*  
Degree: Matura Type B (High school diploma)

## AWARDS AND HONORS

Swiss National Science Foundation Postdoctoral Fellowship 2000 - 2001  
Swiss National Science Foundation Grant 31003A-112455 2006 - 2010  
Novartis Foundation for Medical-Biological Research Grant 2011 - 2012  
SystemsX Bridge to Industry Grant, Co-PI 2011 - 2012  
Seattle Genetics, Industry contract, Co-PI 2013 - 2016  
H2020 MSCA-ITN-EJD Grant 860070 2019 - 2023

## SCIENTIFIC OUTPUT

75 peer reviewed papers, 4310 citations (excl. self-citations), H-index: 32 (status from September 19, 2024)

## BIBLIOGRAPHY

<https://www.ncbi.nlm.nih.gov/myncbi/andrea.prota.1/bibliography/public/>



# Dr. Andrea E. Prota

SENIOR SCIENTIST

## CONTACT INFO



Paul Scherrer Institut  
Center for Life Sciences (CLS)  
Laboratory of Biomolecular  
Research  
Forschungsstrasse 111  
5232 Villigen PSI  
Switzerland



+41 56 310 5160



andrea.prota@psi.ch



<https://www.psi.ch/en/lbr>

## LANGUAGE

Italian:	Native
German:	Native
English:	Excellent
French:	Excellent
Spanish:	Satisfactory

## MAJOR RESEARCH INTREREST

Cancer research  
Neurodegeneration  
Tubulin biology  
Protein interactions  
X-ray crystallography  
Cryo-EM  
Drug discovery

## MEMBERSHIP

American Society for Virology  
Swiss Society for Molecular and  
Cellular Biosciences (SSMCB)

## MORE ABOUT ME

Web of Science ID



R-9526-2019

ORCID-ID



0000-0003-0875-5339

LinkedIn



/andrea-prota-309b09105/

## MAJOR ACHIEVEMENTS SINCE 2019

- Crystallographic fragment screening study that allowed to identify 56 chemically diverse fragments that target ten distinct tubulin sites, six from which were not described before. [10.1002/anie.202100273]
- Fully rationally designed a novel small molecule tubulin inhibitor with a unique molecular mechanism of action, based on a selection of fragments binding to one distinct tubulin site. [10.1002/anie.202204052]
- Development of a second anti-tubulin small molecule using medicinal chemistry technologies, based on a selection of fragments binding to the colchicine site. [j.ejmech.2022.114614]
- Provided structural insight into the stabilization of microtubules by taxanes. [10.7554/eLife.84791]
- Coordination of Workpackage 1 in the ITN-TubInTrain Project, supervising the modeling and evaluation of small molecules to investigate MT breakdown in neurodegeneration. [3 manuscripts *in preparation*]

## KEY PUBLICATIONS SINCE 2019

1. Steinmetz MO, Prota AE. [Structure-based discovery and rational design of microtubule-targeting agents](#). Curr Opin Struct Biol. 2024 Aug;87:102845.
2. Abel AC, Mühlethaler T, Dessin C, Schachtsiek T, Sammet B, Sharpe T, Steinmetz MO, Sewald N, Prota AE. [Bridging the maytansine and vinca sites: Cryptophycins target  \$\beta\$ -tubulin's T5-loop](#). J Biol Chem. 2024 Jun;300(6):107363.
3. Prota AE, Lucena-Agell D, Ma Y, Estevez-Gallego J, Li S, Bargsten K, Josa-Prado F, Altmann KH, Gaillard N, Kamimura S, Mühlethaler T, Gago F, Oliva MA, Steinmetz MO, Fang WS, Díaz JF. [Structural insight into the stabilization of microtubules by taxanes](#). Elife. 2023 Mar 6;12.
4. de la Roche NM, Mühlethaler T, Di Martino RMC, Ortega JA, Gioia D, Roy B, Prota AE, Steinmetz MO, Cavalli A. [Novel fragment-derived colchicine-site binders as microtubule-destabilizing agents](#). Eur J Med Chem. 2022 Nov 5;241:114614.
5. Mühlethaler T, Milanos L, Ortega JA, Blum TB, Gioia D, Roy B, Prota AE, Cavalli A, Steinmetz MO. [Rational Design of a Novel Tubulin Inhibitor with a Unique Mechanism of Action](#). Angew Chem Int Ed Engl. 2022 Jun 20;61(25):e202204052.
6. Mühlethaler T, Gioia D, Prota AE, Sharpe ME, Cavalli A, Steinmetz MO. [Comprehensive Analysis of Binding Sites in Tubulin](#). Angew Chem Int Ed Engl. 2021 Jun 7;60(24):13331-13342.
7. Oliva MA, Prota AE, Rodríguez-Salarichs J, Bennani YL, Jiménez-Barbero J, Bargsten K, Canales Á, Steinmetz MO, Díaz JF. [Structural Basis of Noscapine Activation for Tubulin Binding](#). J Med Chem. 2020 Aug 13;63(15):8495-8501.
8. Jost M, Chen Y, Gilbert LA, Horlbeck MA, Krenning L, Menchon G, Rai A, Cho MY, Stern JJ, Prota AE, Kampmann M, Akhmanova A, Steinmetz MO, Tanenbaum ME, Weissman JS. [Pharmaceutical-Grade Rigosertib Is a Microtubule-Destabilizing Agent](#). Mol Cell. 2020 Jul 2;79(1):191-198.e3.
9. Patterson JC, Joughin BA, Prota AE, Mühlethaler T, Jonas OH, Whitman MA, Varmeh S, Chen S, Balk SP, Steinmetz MO, Lauffenburger DA, Yaffe MB. [VISAGE Reveals a Targetable Mitotic Spindle Vulnerability in Cancer Cells](#). Cell Syst. 2019 Jul 24;9(1):74-92.e8.