

# CURRICULUM VITAE

## Raimund Fromme

### ADDRESS AND PHONE NUMBER:

School of Molecular Sciences  
Former Department of Chemistry and Biochemistry  
Biodesign Institute C at ASU  
Arizona State University (ASU)  
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### Education

Ph.D. in Chemistry, 1994 Technical University of Berlin

Ph.D. Thesis: *Investigations on structure and function of system II of photosynthesis from higher plants and algae (Untersuchungen zur Struktur und Funktion des Photosystems II der Photosynthese aus Höheren Pflanzen und Algen)*,

Prof. Gernot Renger, Advisor

B.S. (Physikum) Medicine from Free University of Berlin 1989

M.S. Biochemistry(Diplom) *Characterization of Herbicide Binding niche at the Acceptor Side of Photosystem II* Free University of Berlin, 1987

B.S. Biochemistry, Free University Berlin, 1985

Citizenship of Germany and USA

## Professional Experience:

- 2014/ 08-present Associate Research Professor  
School of Molecular Sciences  
Biodesign Institute at Arizona State University (ASU)  
Center of Applied Structural Discovery (CASD)
- 2019 /09 – 2022/08 Co- PI with Kevin Redding(ASU) and John Golbeck(PennState)
- 2016 / 09 – 2019/ 08 Co- PI with Kevin Redding(ASU) and John Golbeck(PennState)
- 2013 / 09 – 2016/ 08 Co- PI with Kevin Redding(ASU) and John Golbeck(PennState)  
DoE grant on *Heliobacterium modesticaldum*
- 2009 01-06 International Visiting Research Fellow,  
University of Sydney, Australia
- 2006-2014 Assistant Research Professional for X-ray facility (Protein),  
Department of Chemistry and Biochemistry, ASU
- 2004-2014 Faculty Research Associate  
Department of Chemistry and Biochemistry, ASU
- 2002 -2004 Research Associate at ASU School of Life Sciences
- 2000 -2002 Financial planning and capital administrator free lance
- 1997-1999 Financial planning AWD Company
- 1990-1995 Co-PI and Research Scientist in a project funded by German Government  
(Biological Hydrogen evolution), Prof. Renger, PI
- 1988-1989 Graduate Scholarship from Berlin Government (NaföG)
- 1984-1987 Research Assistant Technical University, Prof. Renger, Supervisor

# Research Interest: Raimund Fromme

## Areas of Study

X-ray Crystallography+++ Light Harvesting +++ Electron transfer+++  
F-Type ATPase+++Sugar binding proteins+++ Photosynthesis +++  
Free Electron Laser in Biology

**Background** The inner sanctum of Photosynthesis the structure and function of Photosystem I and II is since my master thesis and Ph.D. the focus of my research interest. Since fifteen years I have the opportunity to work on crystal structures of various proteins in the broad field of photosynthesis. The membrane proteins are the most interesting and challenging proteins at all. Currently the [Protein Data Bank\(PDB\)](#) has above 200,000 structures, in contrast the number of known membrane protein structures is still around [850 unique](#). Therefore the most important proteins are in their majority still unknown by their structure, beside the fact that the numeric share is at least one third of all proteins. The field of membrane protein structure determination is still in the beginning with a clear growing impact to many research topics in chemistry, biochemistry, biology and medicine.

As protein crystallographer I have contributed to 79 structures in the Protein Data Bank many of them are membrane protein structures. In 2017 I was the corresponding author for the first structure of a heliobacterial photosystem(Science).

Diffraction with the X-ray femtosecond Free Electron Laser(FEL) is the newest tool in structural biology to provide information about the dynamic change of structures like photosystem II or the photoactive yellow protein(PYP).

In this new emerging research field I have co-authored to the following top tier papers 5 in Science, 4 in Nature, 3 Nature Communications, 1 Nature Methods , 3 in PNAS, 2 Structure, 1 Acta Crystallographica A and second tier papers in Optics Express(1) and IUCrJ(3) and Phil Trans R Soc Lond B in the last 7 years.

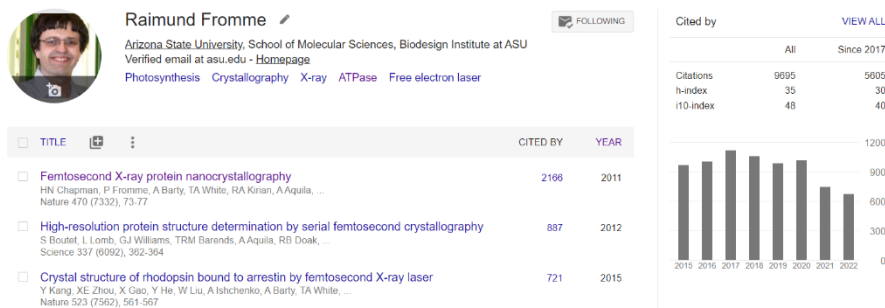
I have co-authored 5 book chapters about photosynthesis and Free electron laser as for one I was the only author.

Reviewing activities

For scientific journals: FEBS Letters, Science Advances, PNAS, Photosynthesis Research, Journal of Physical Chemistry

My home page can be found here <https://raimundfromme.com>

## Publications:



<http://scholar.google.com/citations?user=dJmDDssAAAAJ&hl=en>

- Articles in mostly peer-reviewed Journals  
And Bookchapters\*

### 69. Physachenolide C is a Potent, Selective BET Inhibitor

Christopher J Zerio, Jared Sivinski, EM Kithsiri Wijeratne, Ya-Ming Xu, Duc T Ngo, Andrew J Ambrose, Luis Villa-Celis, Niloofar Ghadirian, Michael W Clarkson, Donna D Zhang, Nancy C Horton, AA Leslie Gunatilaka, **Raimund Fromme**, Eli Chapman

**Journal of Medicinal Chemistry**, Epub 12/28/2022

<https://doi.org/10.1021/acs.jmedchem.2c01770>

### 68. Room-temperature structural studies of SARS-CoV-2 protein NendoU with an X-ray free-electron laser

Rebecca J Jernigan, Dhenugen Logeswaran, Diandra Doppler, Nirupa Nagaratnam, Mukul Sonker, Jay-How Yang, Gihan Ketawala, Jose M Martin-Garcia, Megan L Shelby, Thomas D Grant, Valerio Mariani, Alexandra Tolstikova, Michelle Z Sheikh, Mimi Cho Yung, Matthew A Coleman, Sahba Zaare, Emily K Kaschner, Mohammad Towshif Rabbani, Reza Nazari, Michele A Zacks, Brandon Hayes, Raymond G Sierra, Mark S Hunter, Stella Lisova, Alexander Batyuk, Christopher Kupitz, Sebastien Boutet, Debra T Hansen, Richard A Kirian, Marius Schmidt, **Raimund Fromme**, Matthias Frank, Alexandra Ros, Julian J-L Chen, Sabine Botha, Petra Fromme

**Structure** 10.January 2023 <https://doi.org/10.1016/j.str.2022.12.009>

### 67. Design of novel cyanovirin-N variants by modulation of binding dynamics through distal mutations

I Can Kazan, Prerna Sharma, Mohammad Imtiazur Rahman, Andrey Bobkov, **Raimund Fromme**, Giovanna Ghirlanda, S Banu Ozkan

**eLife** 2022, 11:e67474. DOI: <https://doi.org/10.7554/eLife.67474>

**66. Electrically stimulated droplet injector for reduced sample consumption in serial crystallography**

Mukul Sonker, Diandra Doppler, Ana Egatz-Gomez, Sahba Zaare, Mohammad T Rabbani, Abhik Manna, Jorvani Cruz Villarreal, Garrett Nelson, Gihan K Ketawala, Konstantinos Karpos, Roberto C Alvarez, Reza Nazari, Darren Thifault, Rebecca Jernigan, Dominik Oberthür, Huijong Han, Raymond Sierra, Mark S Hunter, Alexander Batyuk, Christopher J Kupitz, Robert E Sublett, Frederic Poitevin, Stella Lisova, Valerio Mariani, Alexandra Tolstikova, Sebastien Boutet, Marc Messerschmidt, J Domingo Meza-Aguilar, **Raimund Fromme**, Jose M Martin-Garcia, Sabine Botha, Petra Fromme, Thomas D Grant, Richard A Kirian, Alexandra Ros

**Biophysical Reports**(2022)Vol 2/4, 100081, <https://doi.org/10.1016/j.bpr.2022.100081>

**65. Structural and biophysical properties of FopA, a major outer membrane protein of Francisella tularensis**

Nirupa Nagaratnam, Jose M Martin-Garcia, Jay-How Yang, Matthew R Goode, Gihan Ketawala, Felicia M Craciunescu, James D Zook, Manashi Sonowal, Dewight Williams, Thomas D Grant, **Raimund Fromme**, Debra T Hansen, Petra Fromme

**PloS one**(2022) Vol 17/8, e0267370, <https://doi.org/10.1371/journal.pone.0267370>

**64.Co-flow injection for serial crystallography at X-ray free-electron lasers**

Diandra Doppler, Mohammad T. Rabbani, Romain Letrun, Jorvani Cruz Villarreal, Dai Hyun Kim, Sahir Gandhi, Ana Egatz-Gomez, Mukul Sonker, Joe Chen, Faisal H. M. Koua, Jayhow Yang, Mohamed Youssef, Victoria Mazalova, Sas̃a Bajt, Megan L. Shelby, Matt A. Coleman, Max O. Wiedorn, Juraj Knoska, Silvan Schon, Tokushi Sato, Mark S. Hunter, Ahmad Hosseinizadeh, Christopher Kuptiz, Reza Nazari, Roberto C. Alvarez, Konstantinos Karpos, Sahba Zaare, Zachary Dobson, Erin Discianno, Shangji Zhang, James D. Zook, Johan Bielecki, Raphael de Wijn, Adam R. Round, Patrik Vagovic, Marco Kloos, Mohammad Vakili, Gihan K. Ketawala, Natasha E. Stander Tien L. Olson, Katherine Morin, Jyotirmory Mondal, Jonathan Nguyen, Jose Domingo Meza-Aguilar, Gerdenis Kodis, Sara Vaiana, Jose M. MartinGarcia, Valerio Mariani, Peter Schwander, Marius Schmidt, Marc Messerschmidt, Abbas Ourmazd, Nadia Zatsepin, Uwe Weierstall, Barry D. Bruce, Adrian P. Mancuso, Thomas Grant, Anton Barty, Henry N. Chapman, Matthias Frank, **Raimund Fromme**, John C. H. Spence, Sabine Botha, Petra Fromme, Richard A. Kirian and Alexandra Ros

**J. Appl. Cryst.** (2022). 55, 1–13 [https://doi.org/10.1107/S1600576721011079\\_1](https://doi.org/10.1107/S1600576721011079_1)

63. **Segmented flow generator for serial crystallography at the European X-ray free electron laser**

Austin Echelmeier, Jorvani Cruz Villarreal, Marc Messerschmidt, Daihyun Kim, Jesse D. Coe, Darren Thifault, Sabine Botha, Ana Egatz-Gomez, Sahir Gandhi, Gerrit Brehm, Chelsie E. Conrad, Debra T. Hansen, Caleb Madsen, Saša Bajt, J. Domingo Meza-Aguilar, Dominik Oberthür, Max O. Wiedorn, Holger Fleckenstein, Derek Mendez, Juraj Knoška, Jose M. Martin-Garcia, Hao Hu, Stella Lisova, Aschkan Allahgholi, Yaroslav Gevorkov, Kartik Ayyer, Steve Aplin, Helen Mary Ginn, Heinz Graafsma, Andrew J. Morgan, Dominic Greiffenberg, Alexander Klujev, Torsten Laurus, Jennifer Poehlsen, Ulrich Trunk, Davide Mezza, Bernd Schmidt, Manuela Kuhn, **Raimund Fromme**, Jolanta Sztuk-Dambietz, Natascha Raab, Steffen Hauf, Alessandro Silenzi, Thomas Michelat, Chen Xu, Cyril Danilevski, Andrea Parenti, Leonce Mekinda, Britta Weinhausen, Grant Mills, Patrik Vagovic, Yoonhee Kim, Henry Kirkwood, Richard Bean, Johan Bielecki, Stephan Stern, Klaus Giewekemeyer, Adam R. Round, Joachim Schulz, Katerina Dörner, Thomas D. Grant, Valerio Mariani, Anton Barty, Adrian P. Mancuso, Uwe Weierstall, John C. H. Spence, Henry N. Chapman, Nadia Zatsepin, Petra Fromme, Richard A. Kirian & Alexandra Ros

**Nature communications**11, Article number: 4511 (2020)

<https://www.nature.com/articles/s41467-020-18156-7>

\*62. **Application of Hard-X-Ray Free-Electron Lasers for Static and Dynamic Processes in Structural Biology**

Shibom Basu , Petra Fromme and **Raimund Fromme**

Book Editor(s): Jean-Paul Renaud First published:02 January 2020

<https://doi.org/10.1002/9781118681121.ch27>

61. **In cellulo crystallization of Trypanosoma brucei IMP dehydrogenase enables the identification of genuine co-factors**

Karol Nass, Lars Redecke, Markus Perbandt, O Yefanov, M Klinge, R Koopmann, F Stellato, A Gabdulkhakov, R Schönherr, D Rehders, JM Lahey-Rudolph, A Aquila, A Barty, S Basu, RB Doak, R Duden, M Frank, **R Fromme**, Stephan Kassemeyer, G Katona, R Kirian, H Liu, I Majoul, JM Martin-Garcia, M Messerschmidt, Robert L Shoeman, U Weierstall, S Westenhoff, TA White, GJ Williams, CH Yoon, N Zatsepin, P Fromme, M Duszenko, HN Chapman, C Betzel

**Nature communications** 11 (1), 1-13 (2020)

<https://www.nature.com/articles/s41467-020-14484-w>

60. **Time-resolved serial femtosecond crystallography at the European XFEL**

Suraj Pandey, Richard Bean, Tokushi Sato, Ishwor Poudyal, Johan Bielecki, Jorvani Cruz Villarreal, Oleksandr Yefanov, Valerio Mariani, Thomas A White, Christopher Kupitz, Mark Hunter, Mohamed H Abdellatif, Saša Bajt, Valerii Bondar, Austin Echelmeier, Diandra Doppler, Moritz Emons, Matthias Frank, **Raimund Fromme**, Yaroslav Gevorkov, Gabriele Giovanetti, Man Jiang, Daihyun Kim, Yoonhee Kim, Henry Kirkwood, Anna Klimovskaia, Juraj Knoska, Faisal HM Koua, Romain Letrun, Stella Lisova, Luis Maia, Victoria Mazalova, Domingo Meza, Thomas Michelat, Abbas Ourmazd, Guido Palmer, Marco Ramilli, Robin Schubert, Peter Schwander, Alessandro Silenzi, Jolanta Sztuk-Dambietz, Alexandra Tolstikova, Henry N Chapman, Alexandra Ros, Anton Barty, Petra Fromme, Aan P Mancuso, Marius Schmidt

**Nature Methods**, November 18 (2019), <https://doi.org/10.1038/s41592-019-0628-z>

59. **Membrane protein megahertz crystallography at the European XFEL**

Chris Gisriel, Jesse Coe, Romain Letrun, Oleksandr M Yefanov, Cesar Luna-Chavez, Natasha E Stander, Stella Lisova, Valerio Mariani, Manuela Kuhn, Steve Aplin, Thomas D Grant, Katerina Dörner, Tokushi Sato, Austin Echelmeier, Jorvani Cruz Villarreal, Mark S Hunter, Max O Wiedorn, Juraj Knoska, Victoria Mazalova, Shatabdi Roy-Chowdhury, Jay-How Yang, Alex Jones, Richard Bean, Johan Bielecki, Yoonhee Kim, Grant Mills, Britta Weinhausen, Jose D Meza, Nasser Al-Qudami, Saša Bajt, Gerrit Brehm, Sabine Botha, Djelloul Boukhelef, Sandor Brockhauser, Barry D Bruce, Matthew A Coleman, Cyril Danilevski, Erin Discianno, Zachary Dobson, Hans Fangohr, Jose M Martin-Garcia, Yaroslav Gevorkov, Steffen Hauf, Ahmad Hosseinizadeh, Friederike Januschek, Gihan K Ketawala, Christopher Kupitz, Luis Maia, Maurizio Manetti, Marc Messerschmidt, Thomas Michelat, Jyotirmoy Mondal, Abbas Ourmazd, Gianpietro Previtali, Iosifina Sarrou, Silvan Schön, Peter Schwander, Megan L Shelby, Alessandro Silenzi, Jolanta Sztuk-Dambietz, Janusz Szuba, Monica Turcato, Thomas A White, Krzysztof Wrona, Chen Xu, Mohamed H Abdellatif, James D Zook, John CH Spence, Henry N Chapman, Anton Barty, Richard A Kirian, Matthias Frank, Alexandra Ros, Marius Schmidt, **Raimund Fromme**, Adrian P Mancuso, Petra Fromme, Nadia A Zatsepin

**Nature communications**, Nov 4 2019, 10,1,1-11  
<https://www.nature.com/articles/s41467-019-12955-3>

**58. Snapshot of an oxygen intermediate in the catalytic reaction of cytochrome c oxidase**

Izumi Ishigami, Ariel Lewis-Ballester, Austin Echelmeier, Gerrit Brehm, Nadia A. Zatsepin, Thomas D. Grant, Jesse D. Coe, Stella Lisova, Garrett Nelson, Shangji Zhang, Zachary F. Dobson, Sébastien Boutet, Raymond G. Sierra, Alexander Batyuk, Petra Fromme, **Raimund Fromme**, John C. H. Spence, Alexandra Ros, Syun-Ru Yeh, Denis L. Rousseau

**Proceedings of the National Academy of Sciences** Feb 2019, 201814526;

<https://doi.org/10.1073/pnas.1814526116>

**57. X-ray Emission Spectroscopy at X-ray Free Electron Lasers: Limits to Observation of the Classical Spectroscopic Response for Electronic Structure Analysis**

Scott Jensen, Brendan T Sullivan, Daniel A Hartzler, Jose Meza Aguilar, Salah Awel, Sasa Bajt, Shibom Basu, Richard Bean, Henry Chapman, Chelsie Conrad, Matthias Frank, **Raimund Fromme**, Jose M Martin-Garcia, Thomas D Grant, Michael Heymann, Mark S Hunter, Gihan Ketawala, Richard Adam Kirian, Juraj Knoska, Christopher Kupitz, Xuanxuan Li, Mengning Liang, Stella Lisova, Valerio Mariani, Victoria Leonidovna Mazalova, Marc Messerschmidt, Michael Moran, Garrett Nelson, Dominik Oberthuer, Alex Schaffer, Raymond G Sierra, Natalie Vaughn, Uwe Weierstall, Max O Wiedorn, P Lourdu Xavier, Jay-How Yang, Oleksandr Yefanov, Nadia Zatsepin, Andrew L Aquila, Petra Fromme, Sebastien Boutet, Gerald T Seidler, Yulia N Pushkar  
**The Journal of Physical Chemistry Letters** <https://doi.org/10.1021/acs.jpcllett.8b03595>  
(Web): December 19, 2018

**56. Free-electron laser data for multiple-particle fluctuation scattering analysis.**

Pande K, Donatelli JJ, Malmerberg E, Foucar L, Poon BK, Sutter M, Botha S, Basu S, Bruce Doak R, Dörner K, Epp SW, Englert L, **Fromme R**, Hartmann E, Hartmann R, Hauser G, Hattne J, Hosseinizadeh A, Kassemeyer S, Lomb L, Montero SFC, Menzel A, Rolles D, Rudenko A, Seibert MM, Sierra RG, Schwander P, Ourmazd A, Fromme P, Sauter NK, Bogan M, Bozek J, Bostedt C, Schlichting I, Kerfeld CA, Zwart PH

**Sci Data.** 2018 Oct 2;5:180201. <https://nature.com/articles/sdata2018201>



**55. Enzyme intermediates captured "on the fly" by mix-and-inject serial crystallography**

Olmos JL Jr, Pandey S, Martin-Garcia JM, Calvey G, Katz A, Knoska J, Kupitz C, Hunter MS, Liang M, Oberthuer D, Yefanov O, Wiedorn M, Heyman M, Holl M, Pande K, Barty A, Miller MD, Stern S, Roy-Chowdhury S, Coe J, Nagaratnam N, Zook J, Verburgt J, Norwood T, Poudyal I, Xu D, Koglin J, Seaberg MH, Zhao Y, Bajt S, Grant T, Mariani V, Nelson G, Subramanian G, Bae E, **Fromme R**, Fung R, Schwander P, Frank M, White TA, Weierstall U, Zatsepin N, Spence J, Fromme P, Chapman HN, Pollack L, Tremblay L, Ourmazd A, Phillips GN Jr, Schmidt M.

**BMC Biol** 2018 May 31;16(1):59. Epub 2018 May 31

<https://bmcbiol.biomedcentral.com/articles/10.1186/s12915-018-0524-5?report=reader>

**54. Structure of a symmetric photosynthetic reaction center-photosystem**

Christopher Gisriel, Iosifina Sarrou, Bryan Ferlez, John H. Golbeck, Kevin E. Redding, **Raimund Fromme**

**Science** 2017, 357(6355), pp.1021-1025

<https://www.science.org/doi/pdf/10.1126/science.aan5611>

**53. Crystal structure of CO-bound cytochrome c oxidase determined by serial femtosecond X-ray crystallography at room temperature**

Izumi Ishigami, Nadia A. Zatsepin, Masahide Hikita, Chelsie E. Conrad, Garrett Nelson, Jesse D. Coe, Shibom Basu, Thomas D. Grant, Matthew H. Seaberg, Raymond G. Sierra, Mark S. Hunter, Petra Fromme, **Raimund Fromme**, Syun-Ru Yeh, and Denis L. Rousseau

**PNAS** 2017 ; published ahead of print July 11, 2017,

<https://doi.org/10.1073/pnas.1705628114>

**52. Diffraction data of core-shell nanoparticles from an X-ray free electron laser**

Li X, Chiu CY, Wang HJ, Kassemeyer S, Botha S, Shoeman RL, Lawrence RM, Kupitz C, Kirian R, James D, Wang D, Nelson G, Messerschmidt M, Boutet S, Williams GJ, Hartmann E, Jafarpour A, Foucar LM, Barty A, Chapman H, Liang M, Menzel A, Wang F, Basu S, **Fromme R**, Doak RB, Fromme P, Weierstall U, Huang MH, Spence JC, Schlichting I, Hogue BG, Liu H

**Sci Data**. 2017 Apr 11;4:170048. <https://doi.org/10.1038/sdata.2017.48>.

**51. Atomic structure of granulin determined from native nanocrystalline granulovirus using an X-ray free-electron laser**

Cornelius Gati, Dominik Oberthuer, Oleksandr Yefanov, Richard D. Bunker, Francesco Stellato, Elaine Chiu, Shin-Mei Yeh, Andrew Aquila, Shibom Basu, Richard Bean, Kenneth R. Beyerlein, Sabine Botha, Sébastien Boutet, Daniel P. DePonte, R. Bruce Doak, **Raimund Fromme**, Lorenzo Galli, Ingo Grotjohann, Daniel R. James, Christopher Kupitz, Lukas Lomb, Marc Messerschmidt, Karol Nass, Kimberly Rendek, Robert L. Shoeman, Dingjie Wang, Uwe Weierstall, Thomas A. White, Garth J. Williams, Nadia A. Zatsepin, Petra Fromme, John C. H. Spence, Kenneth N. Goldie, Johannes A. Jehle, Peter Metcalf, Anton Barty, and Henry N. Chapman

PNAS ,Feb 15, 2017, 114 (9) 2247-2252 <https://doi.org/10.1073/pnas.1609243114>

**50. Femtosecond structural dynamics drives the trans/cis isomerization in photoactive yellow protein**

Pande, K., Hutchison, C. D. M., Groenhof, G., Aquila, A., Robinson, J. S., Tenboer, J., Basu, S., Boutet, S., DePonte, D. P., Liang, M., White, T. A., Zatsepin, N. A., Yefanov, O., Morozov, D., Oberthuer, D., Gati, C., Subramanian, G., James, D., Zhao, Y., Koralek, J., Brayshaw, J., Kupitz, C., Conrad, C., Roy-Chowdhury, S., Coe, J. D., Metz, M., Xavier, P. L., Grant, T. D., Koglin, J. E., Ketawala, G., **Fromme, R.**, Srajer, V., Henning, R., Spence, J. C. H., Ourmazd, A., Schwander, P., Weierstall, U., Frank, M., Fromme, P., Barty, A., Chapman, H. N., Moffat, K., van Thor, J. J., and Schmidt, M.

Science 2016 May 6;352(6286):725-9. <https://doi.org/10.1126/science.aad5081>

**49. Protein Crystallization in an Actuated Microfluidic Nanowell Device**

Bahige G. Abdallah, Shatabdi Roy-Chowdhury, **Raimund Fromme**, Petra Fromme, and Alexandra Ros

Crystal Growth & Design 2016, 16 (4), pp 2074–2082  
<https://doi.org/10.1021/acs.cgd.5b01748> Publication Date (Web): February 25, 2016

**48. Macromolecular diffractive imaging using imperfect crystals**

Kartik Ayyer, Oleksandr M. Yefanov, Dominik Oberthür, Shatabdi Roy-Chowdhury, Lorenzo Galli, Valerio Mariani, Shibom Basu, Jesse Coe, Chelsie E. Conrad, **Raimund Fromme**, Alexander Schaffer, Katerina Dörner, Daniel James, Christopher Kupitz, Markus Metz, Garrett Nelson, Paulraj Lourdu Xavier, Kenneth R. Beyerlein, Marius Schmidt, Iosifina Sarrou, John C. H. Spence, Uwe Weierstall, Thomas A. White, Jay-How

Yang, Yun Zhao, Mengning Liang, Andrew Aquila, Mark S. Hunter, Joseph S. Robinson, Jason E. Koglin, Sébastien Boutet, Petra Fromme, Anton Barty & Henry N. Chapman

**Nature** 530, 202–206 (11 February 2016) <https://doi.org/10.1038/nature16949>

#### 47. Ternary structure reveals mechanism of a membrane diacylglycerol kinase

Dianfan Li, Phillip J. Stansfeld, Mark S.P. Sansom, Aaron Keogh, Lutz Vogeley, Nicole Howe, Joseph A. Lyons, David Aragao, Petra Fromme, **Raimund Fromme**, Shibom Basu, Ingo Grotjohann, Christopher Kupitz, Kimberley Rendek, Uwe Weierstall, Nadia A. Zatsepin, Vadim Cherezov, Wei Liu, Sateesh Bandaru, Niall J. English, Cornelius Gati, Anton Barty, Oleksandr Yefanov, Henry N. Chapman, Kay Diederichs, Marc Messerschmidt, Sebastien Boutet, Garth J. Williams, M. Marvin Seibert & Martin Caffrey

**Nature Communications** (2015) <https://doi.org/10.1038/ncomms10140> Published 17 Dec 2015

#### 46. Serial femtosecond crystallography of soluble proteins in lipidic cubic phase

**Raimund Fromme**, Andrii Ishchenko, Markus Metz, Shatabdi Roy Chowdhury, Shibom Basu, Sébastien Boutet, Petra Fromme, Thomas A. White, Anton Barty, John C. H. Spence, Uwe Weierstall, Wei Liu and Vadim Cherezov

**IUCrJ**, Volume 2, 5, September 2015, <https://doi.org/10.1107/S2052252515013160>

#### 45. Crystal structure of rhodopsin bound to arrestin by femtosecond X-ray laser

Kang Y, Zhou XE, Gao X, He Y, Liu W, Ishchenko A, Barty A, White TA, Yefanov O, Han GW, Xu Q, de Waal PW, Ke J, Tan MH, Zhang C, Moeller A, West GM, Pascal BD, Van Eps N, Caro LN, Vishnivetskiy SA, Lee RJ, Suino-Powell KM, Gu X, Pal K, Ma J, Zhi X, Boutet S, Williams GJ, Messerschmidt M, Gati C, Zatsepin NA, Wang D, James D, Basu S, Roy-Chowdhury S, Conrad CE, Coe J, Liu H, Lisova S, Kupitz C, Grotjohann I, **Fromme R**, Jiang Y, Tan M, Yang H, Li J, Wang M, Zheng Z, Li D, Howe N, Zhao Y, Standfuss J, Diederichs K, Dong Y, Potter CS, Carragher B, Caffrey M, Jiang H, Chapman HN, Spence JC, Fromme P, Weierstall U, Ernst OP, Katritch V, Gurevich VV, Griffin PR, Hubbell WL, Stevens RC, Cherezov V, Melcher K, Xu HE

**Nature** 2015 <https://doi.org/10.1038/nature14656>, online 22 July 2015

**\*44. Chapter Twenty-Two – Crystallization of Photosystem II for Time-Resolved Structural Studies Using an X-ray Free Electron Laser**

Jesse Coe, Christopher Kupitz, Shibom Basu, Chelsie E. Conrad, Shatabdi Roy-Chowdhury, **Raimund Fromme**, Petra Fromme

*Methods in Enzymology*, Volume 557, 2015, Pages 459-482

**43. A novel inert crystal delivery medium for serial femtosecond crystallography**

Chelsie E. Conrad, Shibom Basu, Daniel James, Dingjie Wang, Alexander Schaffer, Shatabdi Roy-Chowdhury, Nadia A. Zatsepin, Andrew Aquila, Jesse Coe, Cornelius Gati, Mark S. Hunter, Jason E. Koglin, Christopher Kupitz, Garrett Nelson, Ganesh Subramanian, Thomas A. White, Yun Zhao, James Zook, Sébastien Boutet, Vadim Cherezov, John C. H. Spence, **Raimund Fromme**, Uwe Weierstall, and Petra Fromme

IUCrJ Volume 2| Part 4| July 2015| Pages 421-430 ISSN: 2052-2525,  
<https://doi.org/10.1107/S2052252515009811>

**42. Structural basis for bifunctional peptide recognition at human  $\delta$ -opioid receptor.**

Gustavo Fenalti, Nadia A Zatsepin, Cecilia Betti, Patrick Giguere, Gye Won Han, Andrii Ishchenko, Wei Liu, Karel Guillemin, Haitao Zhang, Daniel James, Dingjie Wang, Uwe Weierstall, John CH Spence, Sébastien Boutet, Marc Messerschmidt, Garth J Williams, Cornelius Gati, Oleksandr M Yefanov, Thomas A White, Dominik Oberthuer, Markus Metz, Chun Hong Yoon, Anton Barty, Henry N Chapman, Shibom Basu, Jesse Coe, Chelsie E Conrad, **Raimund Fromme**, Petra Fromme, Dirk Tourwé, Peter W Schiller, Bryan L Roth, Steven Ballet, Vsevolod Katritch, Raymond C Stevens, Vadim Cherezov

*Nature structural & molecular biology* (2015) 22, 265–268

**41. A Hinge Migration Mechanism Unlocks the Evolution of Green-to-Red Photoconversion in GFP-like Proteins.**

Hanseong Kim, Taisong Zou, Chintan Modi, Katerina Dörner, Timothy J Grunkemeyer, Liqing Chen, **Raimund Fromme**, Mikhail V Matz, S Banu Ozkan, Rebekka M Wachter *Structure* 2015 Jan 6;23(1):34-43 <https://doi.org/10.1016/j.str.2014.11.011>

**40. Time-resolved serial crystallography captures high-resolution intermediates Of photoactive yellow protein**

Jason Tenboer, Shibom Basu, Nadia Zatsepin, Kanupria Pande, Despina Milathianaki, Matthias Frank, Mark Hunter, Sébastien Boutet, Garth J. Williams, Jason E. Koglin, Dominik Oberthuer, Michael Heymann, Christopher Kupitz, Chelsie Conrad, Jesse Coe, Shatabdi Roy-Chowdhury, Uwe Weierstall, Daniel James, Dingjie Wang, Thomas Grant, Anton Barty, Oleksandr Yefanov, Jennifer Scales, Cornelius Gati, Carolin Seuring, Vukica Srajer, Robert Henning, Peter Schwander, **Raimund Fromme**, Abbas Ourmazd, Keith Moffat, Jasper Van Thor, John H. C. Spence, Petra Fromme, Henry N. Chapman, Marius Schmidt *Science* 2014, 1242-1246. [<https://doi.org/10.1126/science.1259357>]

### **39. Expression, purification and crystallization of CTB-MPR, a candidate mucosal vaccine component against HIV-1**

H-H Lee, I Cherni, H Yu, **R Fromme**, JD Doran, I Grotjohann, M Mittman, S Basu, A Deb, K Dörner, A Aquila, A Barty, S Boutet, HN Chapman, RB Doak, MS Hunter, D James, RA Kirian, C Kupitz, RM Lawrence, H Liu, K Nass, I Schlichting, KE Schmidt, MM Seibert, RL Shoeman, JCH Spence, F Stellato, U Weierstall, GJ Williams, C Yoon, D Wang, NA Zatsepin, BG Hogue, N Matoba, P Fromme, TS Mor

IUCrJ, 2014, 5, 305-317 September 1 [ [doi:10.1107/S2052252514014900](https://doi.org/10.1107/S2052252514014900) ]

### **38. Visualizing a protein quake with time-resolved X-ray scattering at a free-electron laser**

David Arnlund, Linda C Johansson, Cecilia Wickstrand, Anton Barty, Garth J Williams, Erik Malmerberg, Jan Davidsson, Despina Milathianaki, Daniel P DePonte, Robert L Shoeman, Dingjie Wang, Daniel James, Gergely Katona, Sebastian Westenhoff, Thomas A White, Andrew Aquila, Sadia Bari, Peter Berntsen, Mike Bogan, Tim Brandt vanDriel, R Bruce Doak, Kasper SkovKjær, Matthias Frank, **Raimund Fromme**, Ingo Grotjohann, Robert Henning, Mark S Hunter, Richard A Kirian, Irina Kosheleva, Christopher Kupitz, Mengning Liang, Andrew V Martin, Martin Meedom Nielsen, Marc Messerschmidt, M Marvin Seibert, Jennie Sjöhamn, Francesco Stellato, Uwe Weierstall, Nadia A Zatsepin, John C H Spence, Petra Fromme, Ilme Schlichting, Sébastien Boutet, Gerrit Groenhof, Henry N Chapman & Richard Neutze

Nature Methods (2014) Aug 10. <https://doi.org/10.1038/nmeth.3067>.

### **37. Serial time-resolved crystallography of photosystem II using a femtosecond X-ray laser**

Christopher Kupitz, Shibom Basu, Ingo Grotjohann, **Raimund Fromme**, Nadia A. Zatsepin, Kimberly N. Rendek, Mark S. Hunter, Robert L. Shoeman, Thomas A. White, Dingjie Wang, Daniel James, Jay-How Yang, Danielle E. Cobb, Brenda Reeder, Raymond G. Sierra, Haiguang Liu, Anton Barty, Andrew L. Aquila, Daniel Deponte, Richard A. Kirian, Sadia Bari, Jesse J. Bergkamp, Kenneth R. Beyerlein, Michael J. Bogan, Carl Coleman, Tzu-Chiao Chao, Chelsie E. Conrad, Katherine M. Davis, Holger Fleckenstein, Lorenzo Galli, Stefan P. Hau-Riege, Stephan Kassemeyer, Hartawan Laksmono, Mengning Liang, Lukas Lomb, Stefano Marchesini, Andrew V. Martin, Marc Messerschmidt, Despina Milathianaki, Karol Nass, Alexandra Ros, Shatabdi Roy-Chowdhury, Kevin Schmidt, Marvin Seibert, Jan Steinbrener, Francesco Stellato, Lifan Yan, Chunhong Yoon, Thomas A. Moore, Ana L. Moore, Yulia Pushkar, Garth J.

Williams, Sebastien Boutet, R. Bruce Doak, Uwe Weierstall, Matthias Frank, Henry N. Chapman, John C. H. Spence & Petra Fromme

**Nature** 2014 Jul 9 <https://doi.org/10.1038/nature13453>

**36. Microcrystallization techniques for serial femtosecond crystallography using photosystem II from *Thermosynechococcus elongatus* as a model system**

Christopher Kupitz, Ingo Grotjohann, Chelsie E. Conrad, Shatabdi Roy-Chowdhury, **Raimund Fromme** and Petra Fromme

*Phil. Trans. R. Soc. B* **2014** 369, 20130316, published 9 June 2014

**35. X-Ray Crystal Structure of the passenger domain of Plasmid encoded toxin(Pet), an Autotransporter Enterotoxin from enteroaggregative *Escherichia coli* (EAEC)**

J. Domingo Meza-Aguilar, Petra Fromme, Alfredo Torres-Larios, Guillermo Mendoza-Hernández, Ulises Hernandez-Chiñas, Roberto A. Arreguin-Espinosa de los Monteros, Carlos A. Eslava Campos, **Raimund Fromme**

**Biochemical and Biophysical Research Communications**, Received 31 January 2014, Available online 12 February 2014 <https://doi.org/10.1016/j.bbrc.2014.02.016>

**\*34. Structural Analysis of Photosynthetic Proteins,**

Kupitz, Christopher; **Fromme, Raimund**; Grotjohann, Ingo; Fromme, Petra  
Source: Handbook of Porphyrin Science with Applications to Chemistry, Physics, Materials Science, Engineering, Biology and Medicine, Vol 28: Chlorophyll, Photosynthesis and Bio-Inspired Energy Volume: 28 Pages: 1-40 Published: 2014

**33. Lipidic cubic phase injector facilitates membrane protein serial femtosecond crystallography**

Uwe Weierstall, Daniel James, Chong Wang, Thomas A. White, Dingjie Wang, Wei Liu, John C.H. Spence, R. Bruce Doak, Garrett Nelson, Petra Fromme, **Raimund Fromme**, Ingo Grotjohann, Christopher Kupitz, Nadia A. Zatsepin, Haiguang Liu, Shibom Basu, Daniel Wacker, Gye Won Han, Vsevolod Katritch, Sébastien Boutet, Marc Messerschmidt, Garth J. Williams, Jason E. Koglin, M. Marvin Seibert, Markus Klinker, Cornelius Gati, Robert L. Shoeman, Anton Barty, Henry N. Chapman, Richard A. Kirian, Kenneth R. Beyerlein, Raymond C. Stevens, Dianfan Li, Syed T.A. Shah, Nicole Howe, Martin Caffrey, Vadim Cherezov

**Nature Communications** Accepted 24 Jan 2014 <https://www.nature.com/articles/ncomms4309>

### **32. Serial Femtosecond Crystallography of G Protein–Coupled Receptors**

Wei Liu, Daniel Wacker, Cornelius Gati, Gye Won Han, Daniel James, Dingjie Wang, Garrett Nelson, Uwe Weierstall, Vsevolod Katritch, Anton Barty, Nadia A. Zatsepin, Dianfan Li, Marc Messerschmidt, Sébastien Boutet, Garth J. Williams, Jason E. Koglin, M. Marvin Seibert, Chong Wang, Syed T. A. Shah, Shibom Basu, **Raimund Fromme**, Christopher Kupitz, Kimberley N. Rendek, Ingo Grotjohann, Petra Fromme, Richard A. Kirian, Kenneth R. Beyerlein, Thomas A. White, Henry N. Chapman, Martin Caffrey, John C. H. Spence, Raymond C. Stevens, and Vadim Cherezov

*Science* 20 December 2013: 1521-1524. [<https://doi.org/10.1126/science.1244142>]

### **31. Structure of a photosynthetic reaction centre determined by serial femtosecond crystallography**

Linda C. Johansson, David Arnlund, Gergely Katona, Thomas A. White, Anton Barty, Daniel P. DePonte, Robert L. Shoeman, Cecilia Wickstrand, Amit Sharma, Garth J. Williams, Andrew Aquila, Michael J. Bogan, Carl Caleman, Jan Davidsson, R. Bruce Doak, Matthias Frank, **Raimund Fromme**, Lorenzo Galli, Ingo Grotjohann, Mark S. Hunter, Stephan Kassemeyer, Richard A. Kirian, Christopher Kupitz, Mengning Liang, Lukas Lomb, Erik Malmerberg, Andrew V. Martin, Marc Messerschmidt, Karol Nass, Lars Redecke, M. Marvin Seibert, Jennie Sjöhamn, Jan Steinbrener, Francesco Stellato, Dingjie Wang, Weixiao Y. Wahlgren, Uwe Weierstall, Sebastian Westenhoff, Nadia A. Zatsepin, Sébastien Boutet, John C.H. Spence, Ilme Schlichting, Henry N. Chapman, Petra Fromme & Richard Neutze

*Nature Communications* (2013),4,Article number: 2911  
<https://doi.org/10.1038/ncomms3911>

### **30. Acid-base catalysis and crystal structures of a least-evolved ancestral GFP-like protein undergoing green-to-red photoconversion**

Hanseong Kim, Timothy J Grunkemeyer, Chintan Modi, Liqing Chen, **Raimund Fromme**, Mikhail V. Matz and Rebekka Maria Wachter  
*Biochemistry*, Just Accepted Publication Date (Web): October 17, 2013 (Article)  
<https://doi.org/10.1021/bi401000e>

### **29. Crystallization of a self-assembled three-dimensional DNA nanostructure.**

Rendek KN, **Fromme R**, Grotjohann I, Fromme P.  
*Acta Crystallogr Sect F Struct Biol Cryst Commun*. 2013 Feb 1;69(Pt 2):141-6.  
<https://doi.org/10.1107/S1744309112052128>. Epub 2013 Jan 31.

**28. The 1.6 Å resolution structure of a FRET-optimized Cerulean fluorescent protein.**

Watkins JL, Kim H, Markwardt ML, Chen L, **Fromme R**, Rizzo MA, Wachter RM. *Acta Crystallogr D Biol Crystallogr*. 2013 May;69(Pt 5):767-73. <https://doi.org/10.1107/S0907444913001546>. Epub 2013 Apr 11.

**27. Natively Inhibited Trypanosoma brucei Cathepsin B Structure Determined by Using an X-ray Laser.**

Redecke L, Nass K, Deponte DP, White TA, Rehders D, Barty A, Stellato F, Liang M, Barends TR, Boutet S, Williams GJ, Messerschmidt M, Seibert MM, Aquila A, Arnlund D, Bajt S, Barth T, Bogan MJ, Caleman C, Chao TC, Doak RB, Fleckenstein H, Frank M, **Fromme R**, Galli L, Grotjohann I, Hunter MS, Johansson LC, Kassemeyer S, Katona G, Kirian RA, Koopmann R, Kupitz C, Lomb L, Martin AV, Mogk S, Neutze R, Shoeman RL, Steinbrener J, Timneanu N, Wang D, Weierstall U, Zatsepin NA, Spence JC, Fromme P, Schlichting I, Duszynski M, Betzel C, Chapman HN. *Science* (2013) Volume 339, Pages 227-230.

**26. Improving the Accuracy of Macromolecular Structure Refinement at 7 Å Resolution.**

Axel T. Brunger, Paul D. Adams, Petra Fromme, **Raimund Fromme**, Michael Levitt, Gunnar F. Schröder  
*Structure*(2012) Volume 20, Issue 6, 2012, Pages 957–966

**25. High-Resolution Protein Structure Determination by Serial Femtosecond Crystallography.**

Boutet S, Lomb L, Williams GJ, Barends TR, Aquila A, Doak RB, Weierstall U, Deponte DP, Steinbrener J, Shoeman RL, Messerschmidt M, Barty A, White TA, Kassemeyer S, Kirian RA, Seibert MM, Montanez PA, Kenney C, Herbst R, Hart P, Pines J, Haller G, Gruner SM, Philipp HT, Tate MW, Hromalik M, Koerner LJ, van Bakel N, Morse J, Ghonsalves W, Arnlund D, Bogan MJ, Caleman C, **Fromme R**, Hampton CY, Hunter MS, Johansson L, Katona G, Kupitz C, Liang M, Martin AV, Nass K, Redecke L, Stellato F, Timneanu N, Wang D, Zatsepin NA, Schafer D, Defever J, Neutze R, Fromme P, Spence JC, Chapman HN, Schlichting I.  
*Science*(2012) 339,227-30

**24. Time-resolved protein nanocrystallography using an X-ray free-electron laser.**

Aquila A, Hunter MS, Doak RB, Kirian RA, Fromme P, White TA, Andreasson J, Arnlund D, Bajt S, Barends TR, Barthelmess M, Bogan MJ, Bostedt C, Bottin H, Bozek JD, Caleman C, Coppola N, Davidsson J, DePonte DP, Elser V, Epp SW, Erk B, Fleckenstein H, Foucar L, Frank M, **Fromme R**, Graafsma H, Grotjohann I, Gumprecht L, Hajdu J, Hampton CY, Hartmann A, Hartmann R, Hau-Riege S, Hauser G, Hirsemann H, Holl P, Holton JM, Hömke A, Johansson L, Kimmel N, Kassemeyer S, Krasniqi F, Kühnel KU, Liang M, Lomb L, Malmerberg E, Marchesini S, Martin AV, Maia FR, Messerschmidt M, Nass K, Reich C, Neutze R, Rolles D, Rudek B, Rudenko A, Schlichting I, Schmidt C, Schmidt KE, Schulz J, Seibert MM, Shoeman RL, Sierra R, Soltau H, Starodub D, Stellato F, Stern S, Strüder L, Timneanu N, Ullrich J, Wang X, Williams GJ, Weidenspointner G, Weierstall U, Wunderer C, Barty A, Spence JC,



Chapman HN.

**Opt Express** , 2012 Jan 30;20(3):2706-16. <https://doi.org/10.1364/OE.20.002706>.

**23. Atomic Resolution X-ray Structure of the Substrate Recognition Domain of Higher Plant Ribulose-bisphosphate Carboxylase/Oxygenase (Rubisco) Activase.**

Henderson, J.N., Kuriata, A.M., **Fromme, R.**, Salvucci, M.E. & Wachter, R.M.

*Journal of Biological Chemistry*(2011), vol. 286, no. 41, pp. 35683-35688.

[https://www.jbc.org/article/S0021-9258\(20\)73774-9/fulltext](https://www.jbc.org/article/S0021-9258(20)73774-9/fulltext)

**22. Structure-factor analysis of femtosecond microdiffraction patterns from protein nanocrystals** Kirian RA, White TA, Holton JM, Chapman HN, Fromme P, Barty A, Lomb L, Aquila A, Maia FR, Martin AV, **Fromme R**, Wang X, Hunter MS, Schmidt KE, Spence JC (2011) *Acta Crystallogr A*. (2011) Mar;67(Pt 2):131-40. Epub 2011 Feb 16.

**21. Femtosecond X-Ray Protein Nanocrystallography.** Chapman, H. N., Fromme, P., Barty, A., White, T. A., Kirian, R. A., Aquila, A., Hunter, M. S., Schulz, J., DePonte, D. P., Weierstall, U., Doak, R. B., Maia, F. R. N. C., Martin, A. V., Schlichting, I., Lomb, L., Coppola, N., Shoeman, R. L., Epp, S. W., Hartmann, R., Rolles, D., Rudenko, A., Foucar, L., Kimmel, N., Weidenspointner, G., Holl, P., Liang, M., Barthelmeß, M., Caleman, C., Boutet, S., Bogan, M. J., Krzywinski, J., Bostedt, C., Bajt, S., Gumprecht, L., Rudek, B., Erk, B., Schmidt, C., Hoemke, A., Reich, C., Pietschner, D., Strueder, L., Hauser, G., Gorke, H., Ullrich, J., Herrmann, S., Schaller, G., Schopper, F., Soltau, H., Kuehnel, K., Messerschmidt, M., Bozek, J. D., Hau-Riege, S. P., Frank, M., Hampton, C. Y., Sierra, R. G., Starodub, D., Williams, G. J., Hajdu, J., Timneanu, N., Seibert, M. M., Andreasson, J., Rucker, A., Joensson, O., Svenda, M., Stern, S., Nass, K., Andritschke, R., Schroeter, C., Krasniqi, F., Bott, M., Schmidt, K. E., Wang, X., Grotjohann, I., Holton, J. M., Barends, T. R. M., Neutze, R., Marchesini, S., Fromme, R., Schorb, S., Rupp, D., Adolph, M., Gorkhover, T., Andersson, I., Hirsemann, H., Potdevin, G., Graafsma, H., Nilsson, B., and Spence, J. C. H. *Nature*(2011), 470 , 73-77.

**20. Yueyong Xin , Yih-Kuang Lu, Raimund Fromme, Petra Fromme and Robert E. Blankenship**(2009) Purification, characterization and crystallization of menaquinol:fumarate oxidoreductase from the green filamentous photosynthetic bacterium *Chloroflexus aurantiacus*, *Biochimica et Biophysica Acta (BBA) - Bioenergetics*, Volume 1787, pp. 86-96

**\*19. Raimund Fromme**(2008) in: Photosynthetic protein complexes, Editor: P.Fromme, Ferredoxin and Flavodoxin mediated Electron Transfer in Photosystem I. Bookchapter. Wiley-VCH, Weinheim, pp. 341-352

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- 17. Raimund Fromme, Zivile Katiliene, Petra Fromme, and Giovanna Ghirlanda** (2008) Conformational gating of sugar binding to the antiviral protein cyanovirin revealed from the crystal structure at 1.35 Å resolution. **Protein Science** 17: 939-944
- 16. Fromme, R. Katilene, Z. Giomarelli, B. Bogani, F. McMahon, J. Mori, T. , Fromme, P. Ghirlanda, G.** (2007) A Monovalent Mutant of Cyanovirin-N Provides Insight Into the Role of Multiple Interactions with gp120 for Antiviral Activity, **BIOCHEMISTRY** 46, 9199-9207
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- \*12. Fromme, R., Grotjohann, I., & Fromme, P** (2008) Structure and function of Photosystem I. Editor G. Renger. **Royal Society of Chemistry** (Cambridge, UK) 111-146
- \*11. Fromme, R., Grotjohann, I., & Fromme, P** (2006) Primary Processes in Photosynthesis. Editor R. Grisshammer and S. Buchanan. **Royal Society of Chemistry** (Cambridge, UK) ISBN 0 85404 361 6, Bookchapter. pp. 320-348 Structure of Photosystems I and II
- 10. Fromme, Raimund**(1994) Untersuchungen zur Struktur und Funktion des Photosystems II der Photosynthese aus Höheren Pflanzen und Algen, Verlag Dr. Köster Berlin, ISBN 3-89574-030-6, 159 pages
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**1. Renger, G., Hagemann, R., & Fromme R.** (1986). The susceptibility of the p-benzoquinone-mediated electron transport and atrazine binding to trypsin and its modification by CaCl<sub>2</sub> in thylakoids and PS II membrane fragments. **FEBS Lett.**, 203,2, 210-213

**\* for book chapter**

### **Honors, Awards and Fellowships:**

- 6/2019 Gordon Research Conference on Bioenergetics, Andover, NH, USA, invited talk
- 11/2017 PP Savani University, Surat, Gujarat, India, invited keynote lecture
- 7/2017 Gordon Research Conference on Photosynthesis, Newy, USA invited talk
- 10/2014 Structural Biology symposium University of Alabama Birmingham, USA, keynote lecture
- 2014 International crystallographic conference. CTSB Heraklion, Greece. Opening keynote lecture
- 2009 International Visiting Fellowship University of Sydney, Australia (20,000\$)
- 1988-1989 Two Year Graduate Fellowship, Berlin Government(NaföG)

### **Recent Presentations 2004-2019**

**Fromme,R. (2020)** Time resolved Crystallography of Photosynthetic reactions by use of XFEL at SACLA, 29<sup>th</sup> Western Photosynthesis Conference, January 2-5, Bodega Bay, Ca,USA, **invited talk**

**Fromme, R. (2019)** Structure and Function of Protein Complexes in Photosynthesis, Gordon Research Conference on Photosynthesis, July 21 - 26, Newry, ME, USA  
**Discussion Leader,**

**Fromme, R.(2019)** "Time Resolved Structures of Key Enzymes in Life Processes", Andover, NH, USA, Gordon Research Conference, Bioenergetics, June2-7, **invited talk**

**Fromme, R. (2019)** Photosystem I science with XFEL's, 6<sup>th</sup> Ringberg Meeting, Castle Ringberg from Max-Planck-Society, February 27 – March 2<sup>nd</sup>, near Tegernsee, Germany, **invited talk**

**Fromme, R. (2019)** Photosystem I science with XFEL's, European XFEL Users' Meeting 22 January 2019 / XTOB Headquarters, European XFEL, Schenefeld, Germany  
**invited plenary lecture**

**Fromme, R. (2018)** What can we learn from the high resolution structures of the heliobacterial photosystem and photosystem I of cyanobacteria in respect of evolution of photosynthesis? CMBC 8 th BIT conference, Fukuoka, Japan, October 14-16, **invited talk and discussion leader**

**Fromme,R.(2018)** The trimeric photosystem I at 2.3 Å resolution, ISPR Vancouver, Canada, August 9-12, **Poster Presentation**

**Fromme,R.(2018)** What can we learn from the high resolution structures of the heliobacterial photosystem and photosystem I of cyanobacteria in respect of evolution of photosynthesis? ISPP Vancouver, Canada, August5-9, **Invited lecture**

**Fromme, R.(2018)** The structure of an ancestral photosystem shines light on evolution in photosynthesis, Advanced methods in macromolecular crystallization VIII,FEBS, Academic and University Center, Nové Hradý, Czech Republic June 10-16  
**Invited plenary lecture**

**Fromme, R.(2018)** What can we learn from high resolution Heliobacterial Photosystem and Photosystem I structures in respect of Evolution and Nanotechnology? Nanoworld conference, San Francisco, April 23-25, **invited plenary lecture**

**Fromme, R., (2018)** Challenges and limits of membrane protein structure biology in times of X-ray Free Electron Lasers. Workshop: Dynamics, Structure and Function in Biological Systems Scientific opportunities at ASU Compact X-ray Free Electron Laser Biodesign Institute, Center for Applied Structural Discovery Arizona State University, Tempe, AZ April 6 -8, **invited talk**

**Fromme R.,** Roy-Chowdhury, S., Whitelegge, J. and Fromme, P (2018) The trimeric Photosystem I at 2.3 Å resolution. Oracle AZ, January 4-7, Western Photosynthesis Conference, **poster presentation**

**Fromme, R. (2017)** Structure of the symmetric photosystem from *Heliobacterium modesticaldum*, 8<sup>th</sup> International Conference “Photosynthesis and Hydrogen Energy Research for Sustainability – 2017”, Hyderabad, India, October 30-November 4, **invited talk**

**Fromme, R. (2017)** First structure of an ancestral photosystem /towards time resolved crystallography with X-ray Free electron lasers, PP Savani University, Surat, Gujarat, India, **invited keynote lecture** , November 5

**Fromme, R. (2017)** The structure of an ancestral photosystem shines light on evolution in photosynthesis, University of Hyderabad School of Life Sciences, **invited seminar**, Nov 6 2017

**Fromme, R.,** Gisriel, C., Sarrou, J., Golbeck, J. & Redding, K. (2017) "The High Resolution Structure of the *Heliobacterium modesticaldum* - A Different Reaction Centre" Gordon Research Conference on Photosynthesis, **invited talk**, Newry, MA, USA July 16-21

**Fromme, R. (2017)** Solar light harvesting, a new biological structure in between a Reaction Center and a Photosystem, XLII EL.B.A. NW Nanoforum on Structural NanoProteomics, Pradalunga (Bergamo, Italy) held on 21 June 2017, **invited talk**

**Fromme, R. (2017)** Structure of a homodimeric reaction center, invited talk Arizona Biophest , Tempe, AZ, April 22<sup>nd</sup>, **invited talk**

**Fromme, R.,** Gisriel, C., Sarrou, J., Golbeck, J. & Redding, K. (2017) Reaction Centers in Photosynthesis: *Heliobacterium modesticaldum* has a unique structure compared to the known structures of bacterial reaction centers as the photosystems I and II, **invited talk** 26<sup>th</sup> Western Photosynthesis Conference, Marshall, Ca, January 6- 8

**Fromme, R., (2016)** With continuous diffraction towards high resolution time resolved structures of photosystem II, poster presentation, 17<sup>th</sup> International Photosynthesis Conference, Maastricht, August 8-12, Netherlands

**Fromme, R., (2016)** Time-resolved Crystallography: Workshop at the 60<sup>th</sup> Biophysical Society meeting, Los Angeles, Ca , March 1<sup>st</sup> , invited talk

**Fromme, R., (2016)** TOWARDS HIGH RESOLUTION TIME RESOLVED STRUCTURES OF PHYCOBILIPROTEINS FROM CYANOBACTERIA WITH HARD X-RAY FREE-ELECTRON LASER (FEL), invited talk, 25<sup>th</sup> Western Photosynthesis Conference, Devils' Thumb, CO, USA , January 3-6

**Fromme, R. (2015)** Investigation of coherence in light harvesting proteins from cyanobacteria and cryptophytes with Free electron laser, American Physical Society (APS), Tempe Az, Invited talk, October 17

**Fromme, R. (2015)** Towards time resolved structures of proteins using a hard X-ray Free Electron laser, invited talk, CFEL, Hamburg, Germany, June 11

**Fromme, R. (2015)** Towards time resolved structures of proteins using a hard X-ray Free Electron laser, invited talk, SACLA 1<sup>st</sup> international meeting, Japan March 26-27

**Fromme, R. (2015)** Phycobilisome proteins from *T. elongatus* as model for crystal transfer into Lipidic cubic phase for X-ray Free electron laser (FEL) experiments, invited talk at West Coast Protein Crystallography Workshop, Monterey, Ca, March 15-18

**Fromme, R.,** Roy-Chowdhury, S., Basu, S. and Fromme, P. (2015) Towards time resolved structures of Phycobilisome proteins with a hard X-ray Free electron laser, poster presentation at 2<sup>nd</sup> BioXFEL conference Ponce, Puerto Rico, January 13-17

**Fromme, R (2014)** Towards time resolved structures of membrane proteins using a hard X-ray Free electron laser, Invited seminar Wageningen University, Netherlands, October 29

**Fromme, R (2014)** Towards time resolved structures of membrane proteins using a hard X-ray Free electron laser. Structural Biology symposium University of Alabama Birmingham, USA, **Keynote lecture**, October 8

**Raimund Fromme,** Ingo Grotjohann, Christopher Kupitz, Shibom Basu, Shatabdi Roy-Chowdhury and Petra Fromme(2014) Towards the time resolved X-ray structure determination of proteins in photosynthesis. International crystallographic conference. CTSB Heraklion, Greece. **Opening keynote lecture**, September 19

**Fromme, R.,** S. Roy-Chowdhury, S. Basu and P. Fromme (2014) Towards time resolved structures of Phycobilisome proteins with a X-ray Free electron laser" Gordon Research Conference on Photosynthesis Mount Snow Resort, Vt, USA August 10-15 (Poster Presentation)

**Fromme, R. et al. (2014)** Towards the time resolved Structures using a Hard X-ray Free Electron Laser. BIT's AnalytiX 2014 in Dalian, China(invited oral presentation)

**Fromme, R. (2014)** The First Trimeric Structure of the Membrane Protein Menaquinol Fumarate Reductase at 3.0Å Resolution. BIT's 4<sup>th</sup> Annual World Congress of Molecular & Cell Biology, April 26 in Dalian, China (invited oral presentation).

**Fromme, R. et al. (2013)** Femtosecond nanocrystallography of membrane proteins opens a new era in Structural Biology, 6<sup>th</sup> Asia & Oceanic Conference on Photobiology(AOCP), November 11-16, Sydney, Australia(oral presentation)

**Fromme, R. et al. (2013)** Towards the time resolved X-ray structure determination of Photosystem II", Royal Society Meeting X-ray lasers in biology, London UK, October 14-18(with satellite meeting)

**Fromme, R., Basu, S., Kupitz, C., Grotjohann, I., Fromme, P. (2013)** Towards the time resolved X-ray structure determination of Photosystem II", 16<sup>th</sup> International Photosynthesis Congress St. Louis, USA, August 10-16, (Poster presentation)

**Fromme, R., Xin, Y. Fromme, P. and Blankenship, R. (2013)** Why is QFR a trimer in *Chloroflexus aurantiacus* ? 10<sup>th</sup> European Biophysics Congress Lisbon, Portugal, July 10-16, (Poster presentation)

**Fromme, R., Xin, Y. Fromme, P. and Blankenship, R. (2013)** Why is QFR a trimer in *Chloroflexus aurantiacus* ? 50<sup>th</sup> Gordon Research Conference on Bioenergetics, Procter Academy, Andover NH, June 23-28, (Poster presentation)

**Fromme, R. (2013)** Progress in Photosystem II structure determination in different S-states, 4<sup>th</sup> Imager workshop, Koenigstein(Taunus), Germany, April 23-24, Invited talk.

**Fromme, R. (2013)** Towards the time resolved X-ray structure determination of Photosystem II"EFRC seminar Department of Chemistry and Biochemistry, Arizona State University, April 4. Invited talk.

**Fromme, R., Xin, Y., Fromme, P. Blankenship, R. (2013)** The first Trimeric Structure of the Membrane Protein Menaquinol Fumarate Reductase at 3.0 Å Resolution from *Chloroflexus aurantiacus*. 22<sup>nd</sup> Western Photosynthesis conference Asilomar, Ca. January 3-6. Invited talk.

**Fromme, R., Grotjohann, Kupitz, C., Basu, S., Fromme, P. (2012)** Towards the time resolved X-ray structure determination of proteins. EBEC conference in Freiburg Germany, September 2012, (Poster presentation)



**Fromme, R.**, Sarrou, I. Fromme, P. and Redding, K (2012) 3D DIFFRACTING CRYSTALS OF THE REACTION CENTER FROM *HELIOBACTERIUM MODESTICALDUM*, 21 th Western Photosynthesis Conference Asilomar, Ca , January 5-8.(invited lecture)

**Fromme, R.**, Rendek K. N., Simmons, C, Lin, C, Flory, J., Ingo Grotjohann, Yan Liu, Hao Yan, and Petra Fromme (2011) Crystallization of a 3-D DNA Nanostructure for Development of an Artificial Oxygen-Evolving Complex. 20 th Western Photosynthesis Conference Asilomar, Ca January 6-9 (invited lecture)

**Fromme, R.**, Yu, H., Grotjohann, I., Jolley, C, Wang, M., Bottin, H., Setif, P. & Fromme, P. (2010) Crystal structure of Photosystem I with Ferredoxin, Gordon Research Conference. Diffraction Methods in Structural Biology. July 18-23, Lewis, ME (Poster presentation)

**Rendek K. N. Fromme, R.**, Simmons, C, Lin, C, Flory, J., Grotjohann, I., Liu, Y., Yan, H., and Fromme, P. (2010) Crystallization of a 3-D DNA Nanostructure for Development of an Artificial Oxygen-Evolving Complex. Gordon Research Conference. Diffraction Methods in Structural Biology. July 18-23, Lewis, ME (Poster presentation)

**Fromme, R.**, Chen, M., Larkum, A. & Fromme, P. (2010) LIGHT HARVESTING AND ITS ADAPTATION OF MARINE CYANOBACTERIA AND GREEN ALGAE FROM SAMPLES COLLECTED AT HERON ISLAND (GREAT BARRIER REEF, AUSTRALIA). 19th Western Photosynthesis Conference Asilomar, Ca January 6-9 (Poster presentation)

**Fromme, R.** (2009) Blue proteins in Photosynthesis. Structure of different Phycocyanins and Plastocyanins. University of Sydney, Seminar of the Biology Department May 15 (invited lecture)

**Fromme, R.** (2009) Towards the atomic structure of C-Phycocyanin from *Galdieria sulphuraria* and *Phormidium laminosum*. Australia National University, Canberra, April 6 (invited seminar)

**Fromme, R.**, Bukhman-DeRuyter Y., Vanselow, C., Brune, D., Lee, J. W., Zook, J. and Fromme, P. (2009) HIGH RESOLUTION STRUCTURES OF C-PHYCOCYANIN OF *PHORMIDIUM LAMINOSUM* REVEAL NEW INSIGHTS TO THE ASSEMBLY PROCESS OF THE PHYCOBILISOME Western Photosynthesis Conference, Asilomar, California, January 8-11 (Poster Presentation)

- Fromme, R.**, Katiliene, Z., Fromme, P. and Ghirlanda, G. (2008) Three states of Cyanovirin-N or why we need high resolution X-ray Crystallography. ACS regional Conference LasVegas, Nevada, September 24(invited lecture)
- Fromme, R.**(2008) Photosystem I and its natural electron acceptor ferredoxin in co-crystals at 3.8 Å resolution. Washington University, St. Louis(Mo). August 22(invited seminar)
- Fromme, R.**, Yu, H., Jolley, C., Grotjohann, I., Wang, M., Sétif, Pierre., Bottin, Hervé. and Fromme, P. (2008) Structure of photosystem I and its natural electron acceptor ferredoxin in co-crystals at 3.8 Å resolution. 2008 EBEC Conference, Dublin Ireland, July 17-24, (invited lecture)
- Fromme, R.** (2008) Focus on Membrane Proteins-Photosystem I in a giant supercomplex with ferredoxin –in 2008 National Laboratory Brookhaven(NY). June 18-22, (invited lecture) and *The dialysis method applied to Phycocyanin* –four days each day 6 hours of instruction during the workshop
- Fromme, R.**, Katiliene, Z., Fromme, P. and Ghirlanda, G. (2008) Three states of Cyanovirin-N or why we need high resolution X-ray Crystallography. Seminar in University of Arizona Biophest, Tucson, Arizona, April 19. (invited talk)
- Fromme, R.**, Thangaraj, B., Vanselow, C. and Fromme, P. (2008) Structure of C-phycoyanin at 1.85 Å from *Galdieria sulphuraria*. In 2008 Western Photosynthesis Conference, Asilomar, California, January 3-6 (invited talk)
- Yana S. Bukhman-DeRuyter**, Ingo Grotjohann, Beatrix Schlarb-Ridley, Hualing Mi, **Raimund Fromme** and Petra Fromme. INVESTIGATION OF COMPLEX FORMATION AND CRYSTALLIZATION OF PHOTOSYSTEM I AND PLASTOCYANIN IN CYANOBACTERIA In 2008 Western Photosynthesis Conference, Asilomar, California, January 3-6 (invited talk)
- Ghirlanda, G.**, **Fromme, R.**, Fromme, P., Katiliene, Z., Bogani, F., Giomarelli, B. and Mori, T. (2007) A monovalent mutant of cyanovirin-N provides insight into the role of multiple interactions with gp 120 for antiviral activity. in 2007 Protein Society Boston, MA. (July 21-25)(Poster Presentation)
- Bukhman-DeRuyter, Y.S.**, Grotjohann, I., Schlarb-Ridley, B., Mi, H., **Fromme, R.** and Fromme, P. (2007) Investigation of complex formation and crystallization of photosystem I and plastocyanin in Cyanobacteria. In 2007 Western photosynthesis conference, Asilomar, California. January 4-7(Poster Presentation)
- Thangaraj, B.**, Grotjohann, I., **Fromme, R.**, Talreja, S., Kim, D., Alexander Gunn, D.B. and Fromme, P. (2007) Crystallization and spectroscopic studies of photosystem II. In 2007 Western photosynthesis conference, Asilomar, California. January 4-7(Poster presentation)

- Fromme, R.**, Bukhman-DeRuyter, Y., Vanselow, C., Brune, Dan., Lee, J.W. and Fromme, P. (2007) Structure of C-phycoyanin at 1.9 Å from *Phormidium laminosum*. In 2007 Western photosynthesis conference, Asilomar, California. January 4-7(invited talk)
- Fromme, R.**, Bukhman-DeRuyter, Y., Vanselow, C., Brune, Dan., Lee, J.W. and Fromme, P. (2006) Structure of C-Phycocyanin at 1.96 Å from *Phormidium laminosum*. In 2006 ACS regional conference, Tucson, Arizona. October 14-18 (invited talk)
- Varco-Merth, B.**, Jolley, C., Wang, M. and **Fromme, R.** (2006) The proton-drive turbine of the chloroplast ATP-synthase. In 2006 Western photosynthesis conference, Asilomar, California. January 6-8 (Poster presentation)
- Yu, H.**, **Fromme, R.**, Grotjohann, I., Wang, M., Setif, P., Bottin, H. and Fromme, P. (2006) Investigation of X-ray structure of PS I and its natural electron acceptor ferredoxin. In 2006 Western photosynthesis conference, Asilomar, California. January 6-8 (Poster presentation)
- Fromme, R.**, Yu, H., Grotjohann, I., Wang, M., Setif, P., Bottin, H. and Fromme, P. (2006) X-ray Structure Analysis from co-crystals of Photosystem I and Ferredoxin. Asilomar, California. January 6-8 2006 (invited talk)
- Fromme, R.**, Yu, H., Grotjohann, I. and Fromme, P. (2005) Cocrystals of photosystem I with its soluble natural electron acceptor ferredoxin at 4 Å resolution. In FEBS Congress, Budapest, Hungary (July 2-5)(Poster Presentation)
- He, L.**, **Fromme, R.**, Benston, A. and Frasch, W. (2004) F1-ATPase Molecular Motor Based Single -Molecule Biosensor. In Nanotechnology business opportunities forum, Meritus Mandarin, Singapore(July 26-28)(invited talk)