



## Dr. Mario Novkovic

### Contact

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### Homepage

[www.immunobiology.kssg.ch/](http://www.immunobiology.kssg.ch/)  
[scholar.google.ch/citations?user=t-AHs9YAAAAJ&hl=en&oi=ao](https://scholar.google.ch/citations?user=t-AHs9YAAAAJ&hl=en&oi=ao)

### Units

Medizinisches Forschungszentrum

### Position

Post-Doctoral Fellow  
Informatik Ansprechpartner

### Profile Function

scientist (post doc)

### Research Area

Immunology, Computational Biology, Systems Biology, Computational Modelling, 3D analysis, Biostatistics, Bioinformatics

## Publications (22)

Acton S, Onder L, Novkovic M, Martinez V, Ludewig B. Communication, construction, and fluid control: lymphoid organ fibroblastic reticular cell and conduit networks. *Trends Immunol* 2021; 42:782-794.

Pérez Shibayama C, Gil Cruz C, Colston J, Novkovic M, De Martin A, Ring S, Onder L, Cheng H, Lütge M, Islander U, Ludewig B. Type I interferon signaling in fibroblastic reticular cells prevents exhaustive activation of antiviral CD8 T cells. *Sci Immunol* 2020; 5

Cosgrove J, Uguccioni M, Legler D, Lacey C, Coatesworth A, Polak W, Cupedo T, Manoury B, Thelen M, Stein J, Wolf M, Leake M, Timmis J, Ludewig B, Heller M, Venetz D, Taylor E, Novkovic M, Albrecht S, Pikor N, Zhou Z, Onder L, Mörbe U, Cupovic J, Miller H, Alden K, Thuery A, O'Toole P, Pinter R, Jarrett S, Coles M. B cell zone reticular cell microenvironments shape CXCL13 gradient formation. *Nat Commun* 2020; 11:3677.

Pikor N, Onder L, Linterman M, Nagasawa T, Nombela-Arrieta C, Cheng H, Novkovic M, Pérez Shibayama C, Gil Cruz C, Lütge M, Mörbe U, Ludewig B. Remodeling of light and dark zone follicular dendritic cells governs germinal center responses. *Nat Immunol* 2020; 21:649-659.

Novkovic M, Onder L, Bocharov G, Ludewig B. Topological Structure and Robustness of the Lymph Node Conduit System. *Cell Rep* 2020; 30:893-904.e6.

Gil Cruz C, Jahns R, Wyss M, Mooser C, Lambrecht B, Maeder M, Rickli H, Flatz L, Eriksson U, Geuking M, McCoy K, Boivin-Jahns V, Slack E, Arnoldini M, Pérez Shibayama C, De Martin A, Ronchi F, Van der Borgh K, Niederer R, Onder L, Lütge M, Novkovic M, Nindl V, Ramos G, Ludewig B. Microbiota-derived peptide mimics drive lethal inflammatory cardiomyopathy. *Science* 2019; 366:881-886.

Cheng H, Hehlhans T, Rülcke T, Pfeffer K, Sorg U, Tersteegen A, Miyazaki J, Robinson M, Scandella E, Pikor N, Lütge M, Sonesson C, Novkovic M, Onder L, Ludewig B. Origin and differentiation trajectories of fibroblastic reticular cells in the splenic white pulp. *Nat Commun* 2019; 10:1739.

Novkovic M, Onder L, Cheng H, Bocharov G, Ludewig B. Integrative Computational Modeling of the Lymph Node Stromal Cell Landscape. *Front Immunol* 2018; 9:2428.

Pérez Shibayama C, Gommerman J, Scandella E, Robinson M, Sonesson C, Mack M, Turley S, Buechler M, López-Macías C, Li C, Novkovic M, Mörbe U, Printz A, Onder L, Cheng H, Gil Cruz C, Ludewig B. Fibroblastic reticular cells initiate immune responses in visceral adipose tissues and secure peritoneal immunity. *Sci Immunol* 2018; 3

Cheng H, Brutsche M, Jochum W, Schneider T, Rodriguez R, Tarantino I, Pikor N, Novkovic M, Bösch M, Cupovic J, Onder L, Ludewig B. CCL19-producing fibroblastic stromal cells restrain lung carcinoma growth by promoting local antitumor T-cell responses. *J Allergy Clin Immunol* 2018

Bösch M, Knauer M, Ruhstaller T, Jochum W, Gastl G, Sopper S, Mörbe U, Novkovic M, Cheng H, Onder L, Ludewig B. Interleukin 7-expressing fibroblasts promote breast cancer growth through sustenance of tumor cell stemness. *Oncoimmunology* 2018; 7:e1414129.

Onder L, Scandella E, Sawa S, Mueller C, Gommerman J, Rülcke T, Waisman A, Becher B, Pfeffer K, Hehlhans T, Cheng H, Novkovic M, Pikor N, Mörbe U, Ludewig B. Lymphatic Endothelial Cells Control Initiation of Lymph Node Organogenesis. *Immunity* 2017; 47:80-92.e4.

Novkovic M, Onder L, Bocharov G, Ludewig B. Graph Theory-Based Analysis of the Lymph Node Fibroblastic Reticular Cell Network. *Methods Mol Biol* 2017; 1591:43-57.

Grebennikov D, van Loon R, Novkovic M, Onder L, Savinkov R, Sazonov I, Tretyakova R, J Watson D, Bocharov G. Critical Issues in Modelling Lymph Node Physiology. *Computation* 2016; 5:3.

Gil Cruz C, Scandella E, Ikuta K, Cui G, Abe S, McCoy K, Geuking M, Lang P, Novkovic M, Cheng H, Cupovic J, Chai Q, Onder L, Pérez Shibayama C, Ludewig B. Fibroblastic reticular cells regulate intestinal inflammation via IL-15-mediated control of group 1 ILCs. *Nat Immunol* 2016; 17:1388-1396.

Savinkov R, Kislitsyn A, Watson D, van Loon R, Sazonov I, Novkovic M, Onder L, Bocharov G. Data-driven modelling of the FRC network for studying the fluid flow in the conduit system. *Engineering Applications of Artificial Intelligence* 2016; 62:341-349.

Novkovic M, Turley S, Bocharov G, Stein J, Scandella E, Cremasco V, Bomze D, Abe J, Cupovic J, Onder L, Ludewig B. Topological Small-World Organization of the Fibroblastic Reticular Cell Network Determines Lymph Node Functionality. *PLoS Biol* 2016; 14:e1002515.

Kislitsyn A, Savinkov R, Novkovic M, Onder L, Bocharov G. Computational Approach to 3D Modeling of the Lymph Node Geometry. *Computation* 2015; 3:222-234.

Onder L, Waisman A, Becher B, Ledermann B, Mair F, Maier R, Bomze D, Novkovic M, Caviezel-Firner S, Cheng H, Chai Q, Scandella E, Nindl V, Ludewig B. Alternative NF- $\kappa$ B signaling regulates mTEC differentiation from podoplanin-expressing presursors in the cortico-medullary junction. *Eur J Immunol* 2015

Ilić N, Novkovic M, Guida F, Xhindoli D, Benincasa M, Tossi A, Juretić D. Selective antimicrobial activity and mode of action of adeptantins, glycine-rich peptide antibiotics based on anuran antimicrobial peptide sequences. *Biochim Biophys Acta* 2012; 1828:1004-1012.

Novkovic M, Simunić J, Bojović V, Tossi A, Juretić D. DADP: the database of anuran defense peptides. *Bioinformatics* 2012; 28:1406-7.

Juretić D, Vukičević D, Petrov D, Novkovic M, Bojović V, Lučić B, Ilić N, Tossi A. Knowledge-based computational methods for identifying or designing novel, non-homologous antimicrobial peptides. *Eur Biophys J* 2011; 40:371-85.

## Projects (4)

### **Systems biology approach to molecularly characterize the lung cancer microenvironment**

*Fundamental Research - Jan 1, 2013 - Dec 31, 2014*

*Completed*

### **Systems immunological analysis of lymph node structure and function in viral infection**

*Fundamental Research - Aug 1, 2012 - Jul 31, 2016*

*Completed*

### **Stromal Cell - Immune Cell Interactions in Health and Disease**

*Fundamental Research - Jan 1, 2012 - Jan 31, 2015*

*Completed*

### **Stroma Cell- Immune Cell Interactions in Health and Disease**

*Fundamental Research - Jan 1, 2012 - Dec 31, 2015*

*Completed*