
Dr. Johannes Söllner - Resume

Summary of Qualifications

Strategic Bioinformatics Executive & R&D Leader

with over 25 years of industry experience, specializing in protein engineering and therapeutics. As a translational R&D orchestrator, I bridge the critical gap between bioinformaticians, AI specialists, and wet-lab teams, ensuring that complex computational outputs translate into validated candidates. I leverage a foundational background in machine learning to steer high-stakes project strategies and evaluate optimal computational toolsets, rather than solely developing the architecture. My leadership approach integrates high-acuity somatic awareness to navigate complex group dynamics and activate latent potential in multidisciplinary teams. This human-centric focus, combined with strategic "sweet spot" analysis of IP and feasibility, allows me to architect robust discovery pipelines that drive full-cycle innovation.



Introductory video



Professional Background

Associate Director bioinformatics & AI in protein engineering | [BioNTech R&D Austria](#) (July 2023-December 2025)

- **Strategic Project Content & Scientific Lead:** Directed a €2M+ **strategic protein engineering project based on AI tools**, optimizing team responsibilities by leveraging the unique potentials of 4–9 bioinformaticians, AI experts and life scientists for the discovery and activity/PK engineering of therapeutic enzymes.
- **Therapeutic Payload Design:** Orchestrated the engineering of chimeric lytic proteins (RiboLysins), optimizing enzymatic and binding domains to ensure efficacy under the specific constraints of in vivo expression.
- **AI Search Strategy:** revolutionized a **data and AI-driven search strategy** for new project candidates from literature, news and clinical trials data, directly impacting the therapeutic pipeline.
- **Cross-Functional Synergy:** Eliminated communication silos by serving as the primary liaison between computational & AI units and high-throughput validation teams.
- **Continuous data monitoring:** tasked with exploratory analysis of data using numpy, pandas, matplotlib etc. and setup of the used data platform (Airtable based)

Founder | [sodatana e.U.](#) / Freelancer (January 2015-June 2023; April 2026-ongoing)

- **Ne-novo protein ligand design:** Setup of a cloud for AI workloads (AWS VPC using terraform; EC2, EFS, ECR) and de-novo design of ligands using FreeBindCraft and BoltzGen
- **Immunoinformatics Advisory:** Delivered high-stakes bioinformatics services, including specialized protein subunit modeling and the development of sophisticated antigen fusion and peptide vaccine selection strategies. Project goals were commonly vaccine designs, epitopes for purification of human plasma components and therapeutic proteins.
- **Strategic "Sweet Spot" Analysis:** Balanced computational feasibility with complex Intellectual Property (IP) constraints to design robust R&D roadmaps for clients, collaboration with IP specialists

-
- **Host-Pathogen Intelligence:** Developed scientific hypotheses for complex host-pathogen interactions to drive discovery workflows.
 - **Data Architecture:** Designed and deployed large-scale, integrated databases to house heterogeneous biological data, enabling advanced data mining and R&D insights.
 - **Drug design & diagnostics:** developed a method for peptide fragment based ligand design; various peptide based selections for raising diagnostic antibodies & vaccines (based on biological rationale and ML)
 - **RNA development:** developed an algorithm for mRNA optimization

Innovation Leadership | [emergentec biodevelopment GmbH](#) (2006-December 2014)

Irrespective of position at emergentec I mostly ran contract research projects in an autonomous fashion, meaning I was handed a client problem and returned a result (e.g. a vaccine design) & report commonly within 2-4 weeks, often involving intense client contact. Long-term collaboration with Sterogene Bioseparations (plasma purification resins).

- **Head of Vaccines (2012–2014):** Directed contract R&D operations focused on immunomodulators, antigen design, protein purification and the research into auxiliary small-molecules.
- **Head of Therapeutic Innovation (2010–2011):** Defined the strategic positioning for the company's therapy branch and IP portfolio and conducted contract research. Work on one-health concepts (veterinary / human).
- **Senior Bioinformatician (2008–2010):** Achieved a major milestone by designing antigens for two synthetic veterinary vaccine prototypes that proved superior to competitor products in animal model validations.
- **Monoclonal Antibody Strategy:** Orchestrated a lean-budget strategy to position monoclonal antibodies for major human diseases by identifying high-impact applications and validating them through academic partnerships.
- **Platform Design:** Spearheaded the development of a comprehensive data integration platform for biomarker identification, aggregating protein annotations, clinical trials, patent data, and biomedical literature.
- **Pipeline Innovation:** Engineered and operated a "reverse-vaccinology" pipeline for viral and bacterial pathogens.
- **Drug Repositioning:** Directed the development of systems biology strategies (protein networks/pathways) for small-molecule drug repositioning in oncology and latent infections.
- **Team Mentorship:** Provided high-level supervision for students and developers, ensuring technical excellence across infectious disease and immunology projects.

Bioinformatician | freelancer (2005-2006)

- Focused on immunoinformatics services (vaccine design), patent informatics and automated distributed patent retrieval.
- Internship at [CeMM](#) (Mass-spec data analysis & next target identification)

Bioinformatician & Student | Intercell AG, now [Valneva](#) (2001-2004)

- **Machine Learning:** focused on peptide feature engineering and training of ML models for B-cell epitopes (PhD thesis)
- **Early Innovation:** Invented a proprietary method for in-vitro epitope selection and evolution.
- **Infrastructure Engineering:** Established the foundational automated relational storage and processing pipelines for microbial sequencing data used in epitope identification.
- **Data Visualization:** Led the development of a microbial genome viewer and other advanced visualization tools to interpret complex genomic data.

-
- **IP Support:** Provided technical expertise to the Intellectual Property department and supervised student internships.

Focus on skills, qualifications and interests

Strategic Leadership & R&D Orchestration

- **Translational Bridge Leadership:** Serving as the primary nexus between computational AI units, high-throughput wet-lab validation teams, and IP departments to ensure scientific relevance.
- **High-Acuity Situational Intelligence:** Leveraging advanced somatic awareness and trained sensory perception—refined through specialized craniosacral work—to navigate complex group dynamics and preemptively resolve interpersonal friction in high-stakes R&D environments.
- **Human Capital & Talent Alignment:** Expert at recognizing (latent) potential in multidisciplinary researchers and aligning individual investigator strengths with high-priority objectives to maximize team velocity and quality of scientific output.
- **Science Advocacy & Communication:** Proven ability to translate complex biotechnological relationships for stakeholders, non-scientists, and media via international conferences and public science engagement (a.o. science slam, diverse international conferences).

AI & Computational Drug Discovery

- **Project management:** Directed a €2M+ AI focused project for therapeutic enzyme engineering
- **Pipeline Engineering:** Architect of automated data pipelines and machine learning classifiers for therapeutic discovery (epitope prediction).
- **Predictive Modeling:** Advanced application of pandas & numpy and automated differentiation for signal identification and predictive modeling in assay analysis and protein engineering.
- **Systems Biology:** Deep expertise in bacterial genome analysis, host-pathogen interactions, network based drug repositioning and reverse-vaccinology. Experience with omics data such as genomics and Rnomics.
- **"Sweet Spot" Analysis:** Expert at balancing computational feasibility with doability constraints to design robust data-driven R&D strategies resulting in IP.
- **Full-Cycle Project Steering:** Experience seeing projects from conceptual "search strategy", candidate development through to animal model validation and patent filing.
- **De-novo ligand design:** hands-on using FreeBindCraft, BoltzGen

Technical Proficiencies & Qualifications

- Programming Languages:
 - Current & Fluent: Perl and Python.
 - Prior Expertise: C/C++, R, and JavaScript.
 - Passing knowledge: Java, Rust.
- Core Infrastructure:
 - Cloud & IT: AWS Certified Cloud Practitioner.
 - OS: Linux (Ubuntu preferred) and Windows environments.
 - Specialized Software: a.o. PyMOL, MOE, Jupyter, and FreeCAD (parametric 3D design), ligandMPNN, protein-dpo
- ML/DeepLearning frameworks
 - Reasonably familiar with scikit-learn and keras 3.0 (and underlying frameworks); LangChain for automation / agents

Languages: German (native); English (fluent, written and verbal); Spanish (very basic).

Main education

2004: PhD in Molecular Genetics, University of Vienna, Austria

Development of machine-learning models for prediction of B-cell epitopes on pathogen proteins
2001: Diploma in Molecular Genetics, University of Vienna, Austria (completed with distinction)
Computational analysis of the Staphylococcus aureus COL genome

Selected publications and patents

Multi-dimensional optimization of a lysin towards a ribolysin against life-threatening *S. aureus* infections: Fc-LysM-CHAP and its strong synergy with standard of care antibiotics ([bioRxiv](#); submitted to Nature Biotechnology)

Gyurján I, Sipos-Kozma Z, Ásványi B, Szathmáry M, Kerényi Z, Szenthe K, Söllner J, Szathmáry S, Dénes B, Greff B, Varga L, Bánáti F. Development and validation of an LNA-based one-step multiplex RT-qPCR assay for differentiating Betaarterivirus europensis (PRRSV-1), Betaarterivirus americanus (PRRSV-2), and the highly pathogenic L8 lineage of PRRSV-2. *Vet J*. 2026 Jun 2;106731. doi: 10.1016/j.tvjl.2026.106731. Epub ahead of print. PMID: 42235629.

Selak Sanja, Triska Christine, Schuster Manfred, Söllner Johannes, Roppenser Bernhard, Weinhäupl Theresa, Rössler Max. WO 2021/165543 A1 (**Patent Application**). Propionibacterium Acnes Prophylactic and Therapeutic Immune Treatment. Filed: Feb 22, 2021, Published: Aug 26, 2021, Earliest Priority: Feb 21, 2020

Söllner J. Systems Vaccinology: Applications, Trends and Perspectives. Vaccine Design. Methods and Protocols: Volume 1: Vaccines for Human Diseases. 2016. ISBN 978-1-4939-3385-3

Söllner J. Computational peptide vaccinology. *Methods Mol Biol*. 2015;1268:291-312. doi: 10.1007/978-1-4939-2285-7_13. PubMed PMID: 25555730.

Söllner J, Mayer P, Heinzel A, Fehete R, Siehs C, Oberbauer R, Mayer B. Synthetic lethality for linking the mycophenolate mofetil mode of action with molecular disease and drug profiles. *Mol Biosyst*. 2012 Oct 30;8(12):3197-207. doi: 10.1039/c2mb25256b. PubMed PMID: 23014771.

Lukas Arno, Soellner Johannes, Bernthaler Andreas, Mayer Bernd, Fehete Raul, Perco Paul, Heinzel Andreas (**Patent Application**). Critical gene targets for cytotoxic therapy. WO 2011/144738A1. application date: May 20, 2011

Fehete R, Heinzel A, Perco P, Mönks K, Söllner J, Stelzer G, Eder S, Lancet D, Oberbauer R, Mayer G, Mayer B. Mapping of molecular pathways, biomarkers and drug targets for diabetic nephropathy. *Proteomics Clin Appl*. 2011 Jun;5(5-6):354-66. doi: 10.1002/prca.201000136. Epub 2011 Apr 14. PubMed PMID: 21491608.

Söllner J, Heinzel A, Summer G, Fehete R, Stipkovits L, Szathmáry S, Mayer B. Concept and application of a computational vaccinology workflow. *Immunome Res*. 2010 Nov 3;6 Suppl 2:S7. doi: 10.1186/1745-7580-6-S2-S7. PubMed PMID: 21067549; PubMed Central PMCID: PMC2981879.

Söllner J, Grohmann R, Rapberger R, Perco P, Lukas A, Mayer B. Analysis and prediction of protective continuous B-cell epitopes on pathogen proteins. *Immunome Res*. 2008 Jan 7;4:1. doi: 10.1186/1745-7580-4-1. PubMed PMID: 18179690; PubMed Central PMCID: PMC2244602.

Etz H, Minh DB, Henics T, Dryla A, Winkler B, Triska C, Boyd AP, Söllner J, Schmidt W, von Ahsen U, Buschle M, Gill SR, Kolonay J, Khalak H, Fraser CM, von Gabain A, Nagy E, Meinke A. Identification of in vivo expressed vaccine candidate antigens from Staphylococcus aureus. *Proc Natl Acad Sci U S A*. 2002 May

14;99(10):6573-8. Epub 2002 May 7. PubMed PMID: 11997460; PubMed Central PMCID: PMC124444.

Von Ahsen Uwe, Soellner Johannes, Weichhart Thomas, Hafner Martin (**Patent Application**) S. Aureus antigene. WO 2004/013166 A2; application Jul 22, 2003