

Prof. Dr. Nina Khanna, MD



1. Personal Information

Name: Nina Khanna (married name Khanna Gremmelmaier)
 Born: 13.10.1975
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 Position: Leading Senior Physician, University Hospital Basel, Div. of Infectious Diseases & Hospital Epidemiology
Research Group Leader, University of Basel, Department of Biomedicine Infection Biology

2. Education

2017 Associate Professor (Titularprofessur) for Infectious Diseases, University of Basel, Switzerland
 2011 Venia docendi (Habilitation), University of Basel Medical School, Switzerland
 2010 FMH Infectious Diseases, Swiss Board Examination for Infectious Diseases
 2008 FMH Internal Medicine, Swiss Board Examination for Internal Medicine
 2002 MD, University of Basel, Switzerland
 1997 – 2001 Medical Diploma, University of Basel Medical School, Switzerland
 1995 – 1997 Medical studies, University of Fribourg Medical School, Switzerland

3. Employment History

01/2013 – present Research Group Leader, Infection Biology Laboratory, Department Biomedicine, University of Basel
 04/2010 – present Division of Infectious Diseases and Hospital Epidemiology, University Hospital Basel
 10/2008 – 03/2010 Postdoctoral Fellowship, Gene- and Immunotherapy, University Hospital Würzburg, Germany
 10/2006 – 09/2008 Postdoctoral Fellowship, Institute for Medical Microbiology, University Hospital Basel, Switzerland
 02/2002 – 09/2008 Training in Infectious Diseases and Internal Medicine, University Hospital Basel and Pediatrics (3/2003-2/2004) Kantonsspital Baden, Switzerland

4. Institutional Responsibilities (last 5 years): Member of the

2021 – present Management Team Innovation Focus Cell Therapy
 2021 – present Management Team Department of Biomedicine, University of Basel and University Hospital Basel
 2021 – present Entwicklungs- und Strategieplan (ESP) Working Group, Medical Faculty, University of Basel
 2020 – present Scientific Advisory Committee, Propatient – Research Foundation, University Hospital Basel
 2020 – present Structural Commission for Professorship of Hematology Stem Cell Research, University of Basel
 2020 – present Appeals Committee for Professorship of the Clinical Epidemiology, University of Basel
 2018 – present Subcommission for the Promotion of Young Researchers (= SK2), University of Basel
 2014 – 2018 Steering Committee of the University Basel Immunology Community (UBICO)

5. Approved Research Projects (since 2013)

2021 – 2026 University Hospital of Basel: Innovation Focus Cell Therapy (CHF 5'100'000)
 2021 Propatient Research Grant: Third-Party Donor Registry for Personalized antiviral T-cell Immunotherapeutics (CHF 55'000)
 2020 – 2024 Swiss National Science Foundation. National Center of Competence in Research (NCCR) AntiResist: New approaches to combat antibiotic-resistant bacteria – Grant No. 180541. Member of executive board (CHF 17'000'000)
 2018 Bangerter–Rhyner Grant: (CHF 50'000): A Phase I/II single-center study to assess safety and feasibility of virus-specific T cells of 3rd party donors in patients with treatment-refractory viral infections
 2018 – 2022 Swiss National Science Foundation. Investigator Initiated Clinical Trials (IICT) – Grant No. 179636; Project partner; Using Genetic Risk Factors to Stratify Antifungal Prophylaxis in Patients with Acute Myeloid Leukemia (CHF 2'205'222.00)
 2018 Debiopharm International S.A: Evaluation of Debio 1450 against 24-h biofilm in mouse tissue cage model (combination with: nafcillin, cefazolin, clindamycin, linezolid) (CHF 120'000)
 2017 Bangerter–Rhyner Grant: Immune-metabolic changes in neutrophils, monocytes and lymphocytes in patients suffering from gram-negative sepsis (CHF 90'000)

- 2016 Swiss Transplant Cohort Study. Evolution of mold-specific T cells and NK cells and impact of T-helper 1 Cytokine and Natural Killer (NK) Cell Candidate Genes and on the Development and Outcome of Invasive Mold Infections in Patients after Allogeneic Hematopoietic Stem Cell Transplantation (CHF 29'000)
- 2013 Commission for Technology and Innovation CTI. "HIT to LEAD to preclinical candidate development of a transcription repressor inhibitory compound (TRIC) that increase antibiotic susceptibility of multidrug resistant staphylococci". KTI Project Nr.15235.1 PFLS-LS
- 2013 Swiss National Science Foundation. Ambizione – Grant No. PZ00P3_142403: Relevance of different CD4+ T cell subsets for antifungal defense. What is aberrant in immunocompromised patients? (CHF 813'000)

6. Supervision of Junior Researchers

- Master students: Faculty of science: Pascal Forrer, David Burckhardt, Delphine Cornillet. *Current:* Brice Arnold, Sara Zurbrügg
- PhD students: Justyna Nowakowska, Pascal Forrer. *Current:* Darya Palianina, Aya Iizuka, Benedict Morin (sponsored by MD PhD SNSF program)
- MD students: Sabine Kuster, Yasmin Spahr, Elisabeth Wehrle-Wieland. *Current:* Kai-Manuel Adam, Nathalie Müller, Michaela Schumacher, Flurin Grob
- Postdocs: Matthias Kreuzaler. *Current:* Anne-Kathrin Woischnig, Claudia Stuehler

7. Teaching Activities

- Research tutorials and direct supervision and training for doctoral students (2 per year)
 Courses/lectures in infectious disease and (about 15 per year)
 Bedside teaching to junior physicians

8./9. Active Memberships in Boards, Scientific Societies and Individual Scientific Reviewing Academies

- 2022 ECCMID 2022 Abstract Reviewer
- 2021 – present Editorial board member of the Journal of Transplant Infectious Diseases
- 2021 – present Editorial board member of the Journal of Fungi
- 2019 – present Leader of Clinical Studies and Member of executive board of NCCR AntiResist
- 2018 – present ESCMID Study Group for Immunocompromised Hosts
- 2018 – present ESCMID Study Group Fungal Infection Study Group
- 2017 – present Swisstransplant Arbeitsgruppe Infektiologie (STAI), representative from the USB
- 2016 – present Scientific Advising for the Swiss Society for Infectious Diseases
- 2013 – present European Society of Clinical Microbiology and Infectious Diseases (ESCMID)
- 2010 – present Fungal Infection Network of Switzerland (FUNGINOS); President since 2021
- 2008 – present Infectious Diseases Working Group, Swiss Transplant cohort Study (STCS)
- 2008 – present Schweizerische Gesellschaft für Infektiologie (SGINF)
- 2001 – present Schweizerische Medizinische Gesellschaft (FMH)
- Journals: Chest, British Journal of Medicine, PLOS Pathogens, Clinical Infectious Diseases, Clinical Microbiology and Infection, Bone Marrow Transplantation, Transplant Infectious Disease
- Guidelines: European Hematology Association (EHA), ESCMID

10. Organisation of Conferences

- 2019 First Swiss OPAT Symposium

11. Prizes, Awards, Fellowships

- 2019 Science Award of the city of Basel (Wissenschaftspreis der Stadt Basel)
- 2012 Alumni Award, Medical Faculty, University of Basel, Switzerland
- 2011 Robert Mathis Student Award for best presentation at the eCM XII Implant Infection Meeting Davos, Switzerland, achieved by PhD Student J. Nowakowska
- 2009 Award for best clinical research paper, Swiss Society of Infectious Diseases (SSI)
- 2007 Best poster session of the 11th European Aids Clinical Society Conference, Madrid, Spain
- 2002 Thesis Award Mary & Ewald E. Bertschmann Foundation Award of the Medical Faculty Basel

12. Career Breaks (justification)

- 09/2014 – 01/2015 Maternity leave
- 04/2011 – 08/2011 Maternity leave

Major Scientific Achievements in the Past Five Years

Infectious diseases remain a leading cause of death worldwide. Over the last decades huge advances have been achieved in medicine including complex surgeries, cancer treatment and transplantation. Yet, the success of modern medical procedures is endangered by infectious complications. No or very few new anti-microbial drug substances have been discovered over the last 30 years, which means that very limited therapeutic options are available especially in the context of difficult-to-treat or multi-drug resistant infections.

As physician scientist (research group leader at the Department of Biomedicine and senior leading physician at the Infectious Diseases and Hospital Epidemiology at the University and University Hospital of Basel), I focus on host-specific aspects of difficult-to-treat infectious diseases including viral, fungal and bacterial infections in a strong translational setting and explore new (cell-based) treatment strategies with the overarching goal to improve outcome of infections.

Major achievements in research include a recent publication in Cell on "Immunomimetic Designer Cells Protect Mice from MRSA Infection", for which I was awarded with the "Science Award of the city of Basel" in 2019. I pioneered adoptive virus T cell therapy in patients after allogeneic hematopoietic cell transplantation with viral infections in Switzerland (Clin Trials ID NCT02007356) in 2015. In 2020, we were funded by National Center of Competence in Research (NCCR) AntiResist, which aims at identifying new approaches to combat antibiotic-resistant bacteria, in which I am an executive board member and the leader of the clinical studies.

Detailed information on these and other achievements over the last five years are outlined herein.

Pathogen-specific T cell therapies for the clinics

Viral and fungal infections contribute to substantial morbidity in immune compromised patients particularly after transplantation. Anti-infective drugs alone are often ineffective due to the lacking immune responses or are associated with a substantial toxicity and/or development of resistant variants. Adoptive transfer of pathogen-specific donor-derived T cells may restore the lacking recipients' T cell function.

We have been pursuing experimental and clinical pathogen-specific T cell immunotherapy studies for more than 10 years. We have progressively established methods and approaches including (i) identification of approaches for virus and fungus specific immunotherapy (Khanna N, et al. Blood 2011; Stuehler C, et al. Journal of Infect Dis 2015), (ii) characterization of T cell epitopes and repertoire in patients and healthy donors (Stuehler C, et al. AIDS 2016; Stuehler C, et al. Blood 2011; Stuehler C, et al. J Infect Dis 2015; Nowakowska J, et al. 2015) and (iii) introduction of a clinical immunotherapy trial with virus-specific T cells at the Hematology and Infectious Diseases Division in Basel.

In this ongoing multi-center Phase I/II trial that started in 2015, we assess for the first time in Switzerland the safety and feasibility of virus-specific T cells in recipients of allogeneic HCT with adenovirus, CMV or EBV infections using the CliniMACS Cytokine Capture System and the CliniMACS Plus instrument (Clin Trials ID NCT02007356). Antigens include GMP-approved overlapping oligopeptides (mainly 15-mer) of CMV, adenovirus hexon and EBV proteins. The preliminary data of 12 patients (5 for CMV and 7 for EBV) confirm the feasibility and safety of the approach, as T cell products could be successfully manufactured for all patients. The preliminary data also indicate therapeutic efficacy: 6 of 7 evaluable patients showed a clinical response to the treatment. One case was published in 2015 (Stuehler C, et al. Transplant Infectious Disease 2015).

Host control against infections

Host control of bacterial infections crucially depends on neutrophils and their capability to kill pathogens with reactive oxygen species (ROS). We have explored the role of myeloperoxidase in neutrophils and identified that it targets oxidative host attacks to bacteria and prevents collateral tissue damage (Schuermann N, Forrer P, et al. Nat Microbiology 2017). We have also found that antigen presenting cell-like neutrophils emerge during sepsis and activate T cell responses (Forrer P, Kreuzaler M, et al. in preparation).

Novel approaches for *Staphylococcus aureus* infections

Invasive staphylococcal infections are often resilient to antibiotic treatment despite *in vitro* activity of the applied antibiotics. This has been attributed to pathogen but also host-related factors. Our goal is to unravel mechanisms of the pathogen and host evasion in the context of treatment failure and to find new strategies to treat these patients. This research is enabled by the NCCR "AntiResist" allowing longterm funding in an interdisciplinary setting for antibiotic research linking basic research directly with clinical research (<https://www.nccr-antiresist.ch/en/>).

In the past, we have explored different treatment strategies against biofilm-forming staphylococcal infections using *in vitro* and *in vivo* mouse models (Nowakowska J, et al., Antibiotics 2014). We have identified different anti-infective coatings and new compounds or antibodies efficiently combatting these infections (Priebe M, et al. Nanomedicine 2017; Kuehl R, et al. Antimicrob Agents Chemother 2016; Woischnig A, et al. Int J Pharm. 2018; Estelles A, Woischnig A, et al. Antimicrob Agents Chemother 2016; Nowakowska J, et al. Antimicrob Agents Chemother. 2013; John AK, et al. Antimicrob. Agents Chemother 2011).

We demonstrated that engineered designer cells containing a synthetic genetic circuit expressing lysostaphin under the regulation of human Toll-like receptor (TLR) 2, TLR1, TLR6, and CD14 can effectively sense methicillin-resistant *S. aureus* (MRSA) implant-associated infections by detection of blood reporter proteins and prevent as well as cure infections in our tissue cage infection mouse model. This study highlights that genetically engineered cellular therapies may be in future applicable also for bacterial infections (Liu Y, et al. Cell 2018).

Collaborations and Funding

Over the last years, I have established and strengthened different national and international collaborative networks. Collaborations include the Infection Biology Research groups at the Biozentrum University of Basel (NCCR Antiresist), D-BSSE ETH Zürich in Basel (Prof. M. Fussenegger and NCCR Antiresist), University of Fribourg (Prof. K. Fromm, Commission for Technology and Innovation (CTI) grant) and international collaborations within an European Cooperation in Science & Technology (COST) TD1305 - iPromedai.

Vision

Clearly, the emergence of infectious complications in modern medicine with the development of multiresistant pathogens contrasted by the empty anti-infective pipelines, represents an unmet clinical need and requires urgent action to develop new anti-infective strategies.

We envision to investigate the underlying mechanism of treatment resilience of *S. aureus* in human deep seated infections which is thought to result from dormant *S. aureus*, intracellular *S. aureus*, and/or diminished innate and adaptive immunity and utilize the new insights to develop and test novel host-targeted strategies for breaking *S. aureus* persistence.

Cell based therapies for viral infections are promising. Our goal within the next five years is to broaden the application for virus-specific T cell therapy to patients after solidorgan transplantation and with virus-associated solid tumors and to expand our arsenal to target further viral infections (JCV, BKV, HHV-6 etc.).

Research Output List of the Last Five Years

[Link to all publications](#)

1. Publications in International Peer-Reviewed Scientific Journals

- 1) Sava M, Sommer G, Daikeler T, Woischnig AK, Martinez AE, Leuzinger K, Hirsch H, Erlanger T, Wiencierz A, Bassetti S, Tamm M, Tschudin-Sutter S, Stoeckle M, Pargger H, Siegemund M, Boss R, Zimmer G, Vu DL, Kaiser L, Dell-Kuster S, Weisser M, Battegay M, Hostettler K, **Khanna N**. Ninety-day outcome of patients with severe COVID-19 treated with tocilizumab - a single centre cohort study. *Swiss Med Wkly*. Aug 10, 2021
- 2) Diebold M, Martinez AE, Adam KM, Bassetti S, Osthoff M, Kassi E, Steiger J, Pargger H, Siegemund M, Battegay M, **Khanna N**, Schaub S, Wesch C, Dickenmann M, Weisser M. Temporal trends of COVID-19 related in-hospital mortality and demographics in Switzerland - a retrospective single centre cohort study. *Swiss Med Wkly*. Jul 19, 2021
- 3) Sedlmayer F, Woischnig AK, Unterreiner V, Fuchs F, Baeschlin D, **Khanna N**, Fussenegger M. 5-Fluorouracil blocks quorum-sensing of biofilm-embedded methicillin-resistant *Staphylococcus aureus* in mice. *Nucleic Acids Res*. Jul 21, 2021
- 4) Kohler P, Wolfensberger A, Stampf S, Brönnimann A, Boggian K, van Delden C, Favre M, Hirzel C, **Khanna N**, Kuster SP, Manuel O, Neofytos D, Ragozzino S, Schreiber PW, Walti L, Mueller NJ; Swiss Transplant Cohort Study. Temporal trends, risk factors and outcomes of infections due to extended-spectrum β -lactamase producing Enterobacterales in Swiss solid organ transplant recipients between 2012 and 2018. *Antimicrob Resist Infect Control*. Mar 7, 2021
- 5) Rüeger S, Hammer C, Loetscher A, McLaren PJ, Lawless D, Naret O, **Khanna N**, Bernasconi E, Cavassini M, Günthard HF, Kahlert CR, Rauch A, Depledge DP, Morfopoulou S, Breuer J, Zdobnov E, Fellay J; Swiss HIV Cohort Study. The influence of human genetic variation on Epstein-Barr virus sequence diversity. *Sci Rep*. Feb 25, 2021
- 6) Janiaud P, Axfors C, Schmitt AM, Gloy V, Ebrahimi F, Hepprich M, Smith ER, Haber NA, **Khanna N**, Moher D, Goodman SN, Ioannidis JPA, Hemkens LG. Association of Convalescent Plasma Treatment with Clinical Outcomes in Patients with COVID-19. *JAMA*. Feb 26, 2021
- 7) Sjøgaard KK, Baettig V, Osthoff M, Marsch S, Leuzinger K, Schweitzer M, Meier J, Bassetti S, Bingisser R, Nickel CH, **Khanna N**, Tschudin-Sutter S, Weisser M, Battegay M, Hirsch HH, Pargger H, Siegemund M, Egli A. Community-acquired and hospital-acquired respiratory tract infection and bloodstream infection in patients hospitalized with COVID-19 pneumonia. *J Intensive Care*. Jan 18, 2021
- 8) Kraljevic M, **Khanna N**, Medinger M, Passweg J, Masouridi-Levrat S, Chalandon Y, Mueller NJ, Schanz U, Vernaz N, Van Delden C, Neofytos D; Swiss Transplant Cohort Study. Clinical considerations on posaconazole administration and therapeutic drug monitoring in allogeneic hematopoietic cell transplant recipients. *Med Mycol*. Dec 31, 2020
- 9) Hinić V, Seth-Smith HMB, Damm S, Amico P, **Khanna N**, Egli A, Bättig V. Unexpected *Mycoplasma hominis* infection in two renal transplant recipients traced back to the same donor by whole-genome sequencing. *Eur J Clin Microbiol Infect Dis*. Dec 23, 2020
- 10) Leuzinger K, Gosert R, Sjøgaard KK, Naegele K, Bielicki J, Roloff T, Bingisser R, Nickel CH, **Khanna N**, Sutter ST, Widmer AF, Rentsch K, Pargger H, Siegemund M, Stolz D, Tamm M, Bassetti S, Osthoff M, Battegay M, Egli A, Hirsch HH. Epidemiology and precision of SARS-CoV-2 detection following lockdown and relaxation measures. *J Med Virol*. Dec 14, 2020
- 11) Kusejko K, Günthard HF, Olson GS, Zens K, Darling K, **Khanna N**, Furrer H, Vetter P, Bernasconi E, Vernazza P, Hoffmann M, Kouyos RD, Nemeth J; Swiss HIV Cohort Study. Diagnosis of latent tuberculosis infection is associated with reduced HIV viral load and lower risk for opportunistic infections in people living with HIV. *PLoS Biol*. Dec 7;18(12), 2020
- 12) Boeddinghaus J, Nestelberger T, Kaiser C, Twerenbold R, Fahrni G, Bingisser R, **Khanna N**, Tschudin Sutter S, Widmer A, Jeger R, Kaufmann B, Pfister O, Sticherling C, Müller C, Osswald S, Zellweger MJ, Kühne M. Effect of COVID-19 on acute treatment of ST-segment elevation and Non-ST-segment elevation acute coronary syndrome in northwestern Switzerland. *Int J Cardiol Heart Vasc*. Dec 4;32:100686, 2020
- 13) Walti LN, Mugglin C, Sidler D, Mombelli M, Manuel O, Hirsch HH, **Khanna N**, Mueller N, Berger C, Boggian K, Garzoni C, Neofytos D, van Delden C, Hirzel C, Transplant Cohort Study Stcs S. Association of Antiviral Prophylaxis and Rituximab Use with Post-transplant Lymphoproliferative Disorders (PTLD): A Nationwide Cohort Study. *Am J Transplant*. Dec 2, 2020
- 14) Studer U, **Khanna N**, Leuzinger K, Hirsch HH, Heim D, Lengerke C, Tsakiris DA, Halter J, Gerull S, Passweg J, Medinger M, Gwerder M. Incidence of CMV Replication and the Role of Letemovir Primary/Secondary

Prophylaxis in the Early Phase After Allogeneic Hematopoietic Stem Cell Transplantation - A Single Centre Study. *Anticancer Res.* Oct;40(10):5909-5917, **2020**

- 15) Weisshaar K, Ewald H, Halter J, Gerull S, Schönfeld S, Senft Y, Martinez M, Leuppi-Taegtmeyer A, **Khanna N**, Maier B, Risitano A, Peffault de Latour R, Tichelli A, Passweg J, Drexler B. D. Development of a patient-reported outcome questionnaire for aplastic anemia and paroxysmal nocturnal hemoglobinuria (PRO-AA/PNH). *Orphanet J Rare Dis.* Sep 17;15(1):249, **2020**
- 16) Leuzinger K, Roloff T, Gosert R, Sogaard K, Naegele K, Rentsch K, Bingisser R, Nickel CH, Pargger H, Bassetti S, Bielicki J, **Khanna N**, Tschudin Sutter S, Widmer A, Hinic V, Battegay M, Egli A, Hirsch HH. Epidemiology of Severe Acute Respiratory Syndrome Coronavirus 2 Emergence Amidst Community-Acquired Respiratory Viruses. *J Infect Dis.* Sep 14;222(8):1270-1279, **2020**
- 17) Balmer ML, Ma EH, Thompson AJ, Epple R, Unterstab G, Lötscher J, Dehio P, Schürch CM, Warncke JD, Perrin G, Woischnig AK, Grähler J, Löliger J, Assmann N, Bantug GR, Schären OP, **Khanna N**, Egli A, Bubendorf L, Rentsch K, Hapfelmeier S, Jones RG, Hess C. Memory CD8+ T Cells Balance Pro- and Anti-inflammatory Activity by Reprogramming Cellular Acetate Handling at Sites of Infection. *Cell Metab.* Sep 1;32(3):457-467.e5, **2020**
- 18) Marzolini C, Stader F, Stoeckle M, Franzeck F, Egli A, Bassetti S, Hollinger A, Osthoff M, Weisser M, Gebhard CE, Baettig V, Geenen J, **Khanna N**, Tschudin-Sutter S, Mueller D, Hirsch HH, Battegay M, Sendi P. Effect of Systemic Inflammatory Response to SARS-CoV-2 on Lopinavir and Hydroxychloroquine Plasma Concentrations. *Antimicrob Agents Chemother.* Aug 20;64(9):e01177-20, **2020**
- 19) Durovic A, Seth-Smith HMB, Hinic V, Kurz M, **Khanna N**, Egli A. Two simultaneous cases of disseminated infections with *Campylobacter fetus*: clinical characteristics and molecular comparison. *Clin Microbiol Infect.* Jul 24;S1198-743X(20)30425-0, **2020**
- 20) Olearo F, Kronig I, Masouridi-Levrat S, Chalandon Y, **Khanna N**, Passweg J, Medinger M, Mueller NJ, Schanz U, Van Delden C, Neofytos D. Optimal Treatment Duration of *Pseudomonas aeruginosa* Infections in Allogeneic Hematopoietic Cell Transplant Recipients. *Open Forum Infect Dis.* Jun 23;7(7):ofaa246, **2020**
- 21) Zingg S, Nicoletti GJ, Kuster S, Junker M, Widmer A, Egli A, Hinic V, Sendi P, Battegay M, Bättig V, **Khanna N**, Tschudin-Sutter S. Cefiderocol for Extensively Drug-Resistant Gram-Negative Bacterial Infections: Real-world Experience From a Case Series and Review of the Literature. *Open Forum Infect Dis.* May 21;7(6):ofaa185, **2020**
- 22) Tschopp J, L'Huillier AG, Mombelli M, Mueller NJ, **Khanna N**, Garzoni C, Meloni D, Papadimitriou-Olivgeris M, Neofytos D, Hirsch HH, Schuurmans MM, Müller T, Berney T, Steiger J, Pascual M, Manuel O, van Delden C; Swiss Transplant Cohort Study (STCS). First experience of SARS-CoV-2 infections in solid organ transplant recipients in the Swiss Transplant Cohort Study. *Am J Transplant.* May 15, **2020**
- 23) Vu DL, Dayer JA, Masouridi-Levrat S, Combescure C, Boely E, **Khanna N**, Mueller NJ, Kleber M, Medinger M, Halter J, Passweg J, Müller AM, Schanz U, Chalandon Y, Neofytos D, van Delden C, Kaiser L; Swiss Transplant Cohort Study. Microbiologically documented infections after adult allogeneic hematopoietic cell transplantation: A 5-year analysis within the Swiss Transplant Cohort study. *Transpl Infect Dis.* Apr 11:e13289, **2020**
- 24) Poissy J, Damonti L, Bignon A, **Khanna N**, Von Kietzell M, Boggian K, Neofytos D, Vuotto F, Coiteux V, Artru F, Zimmerli S, Pagani JL, Calandra T, Sendid B, Poulain D, van Delden C, Lamoth F, Marchetti O, Bochud PY; FUNGINOS; Allfun French Study Groups. Risk factors for candidemia: a prospective matched case-control study. *Crit Care.* Mar 18;24(1):109, **2020**
- 25) Stemler J, Bruns C, Mellinshoff SC, Alakel N, Akan H, Ananda-Rajah M, Auberger J, Bojko P, Chandrasekar PH, Chayakulkeeree M, Cozzi JA, de Kort EA, Groll AH, Heath CH, Henze L, Hernandez Jimenez M, Kanj SS, **Khanna N**, Koldehoff M, Lee DG, Mager A, Marchesi F, Martino-Bufarull R, Nucci M, Oksi J, Pagano L, Phillips B, Prattes J, Pырpasopoulou A, Rabitsch W, Schalk E, Schmidt-Hieber M, Sidharthan N, Soler-Palacín P, Stern A, Weinbergerová B, El Zakhem A, Cornely OA, Koehler P. Baseline Chest Computed Tomography as Standard of Care in High-Risk Hematology Patients. *J Fungi (Basel).* Mar 13;6(1):36, **2020**
- 26) Glampedakis E, Cassaing S, Fekkar A, Dannaoui E, Bougnoux ME, Bretagne S, Neofytos D, Schreiber PW, Hennequin C, Morio F, Shadrivova O, Bongomin F, Fernández-Ruiz M, Bellanger AP, Arikani-Akdagli S, Erard V, Aigner M, Paolucci M, **Khanna N**, Charpentier E, Bonnal C, Brun S, Gabriel F, Riat A, Zbinden R, Le Pape P, Klimko N, Lewis RE, Richardson M, Inkaya AC, Coste AT, Bochud PY, Lamoth F. Invasive aspergillosis due to *Aspergillus section Usti*: a multicenter retrospective study. *Clin Infect Dis.* Mar 10;ciaa230, **2020**
- 27) Van Delden C, Stampf S, Hirsch HH, Manuel O, Meylan P, Cusini A, Hirzel C, **Khanna N**, Weisser M, Garzoni C, Boggian K, Berger C, Nadal D, Koller M, Saccilotto R, Mueller NJ; Swiss Transplant Cohort Study. Burden and Timeline of Infectious Diseases in the First Year After Solid Organ Transplantation in the Swiss Transplant Cohort Study. *Clin Infect Dis.* Oct 23;71(7):e159-e169, **2020**

- 28) Erba A, Beuret M, Daly ML, **Khanna N**, Osthoff M. OPAT in Switzerland: single-center experience of a model to treat complicated infections. *Infection*. Apr;48(2):231-240, **2020**
- 29) Wüthrich D, Cuénod A, Hinic V, Morgenstern M, **Khanna N**, Egli A, Kuehl R. Genomic characterization of inpatient evolution of MRSA resistant to daptomycin, vancomycin and ceftaroline. *J Antimicrob Chemother*. May 1;74(5):1452-1454, **2019**
- 30) Moriarty TF, Harris LG, Mooney RA, Wenke JC, Riool M, Zaat SAJ, Moter A, Schaer TP, **Khanna N**, Kuehl R, Alt V, Montali A, Liu J, Zeiter S, Busscher HJ, Grainger DW, Richards RG. Recommendations for Design and Conduct of Preclinical in Vivo Studies of Orthopedic Device-Related Infection. *J Orthop Res*. Feb;37(2):271-287, **2019**
- 31) Jayachandran R, Gumienny A, Bolinger B, Ruehl S, Lang MJ, Fucile G, Mazumder S, Tchang V, Woischnig AK, Stiess M, Kunz G, Claudi B, Schmalzer M, Siegmund K, Li J, Dertschnig S, Holländer G, Medina E, Karrer U, Moshous D, Bumann D, **Khanna N**, Rossi SW, Pieters J. Disruption of Coronin 1 Signaling in T Cells Promotes Allograft Tolerance while Maintaining Anti-Pathogen Immunity. *Immunity*. Jan 15;50(1):152-165.e8, **2019**
- 32) Neofytos D, Hirzel C, Boely E, Lecompte T, **Khanna N**, Mueller NJ, Boggian K, Cusini A, Manuel O, van Delden C; Swiss Transplant Cohort Study. Pneumocystis jirovecii pneumonia in solid organ transplant recipients: a descriptive analysis for the Swiss Transplant Cohort. *Transpl Infect Dis*. Dec;20(6):e12984, **2018**
- 33) Kuster S, Stampf S, Gerber B, Baettig V, Weisser M, Gerull S, Medinger M, Passweg J, Schanz U, Garzoni C, Berger C, Chalandon Y, Mueller NJ, van Delden C, Neofytos D, **Khanna N**; Swiss Transplant Cohort Study. Incidence and Outcome of Invasive Fungal Diseases after Allogeneic Hematopoietic Stem Cell Transplantation: A Swiss Transplant Cohort Study. *Transpl Infect Dis*. Dec;20(6):e12981, **2018**
- 34) Woischnig AK, Gonçalves LM, Ferreira M, Kuehl R, Kikhney J, Moter A, Ribeiro IAC, Almeida AJ, **Khanna N**, Francisca Bettencourt A. Acrylic microparticles increase daptomycin intracellular and in vivo anti-biofilm activity against Staphylococcus aureus. *Int J Pharm*. Oct 25;550(1-2):372-379, **2018**
- 35) Robert-Gangneux F, Meroni V, Dupont D, Botterel F, Garcia JMA, Brenier-Pinchart MP, Accoceberry I, Akan H, Abbate I, Boggian K, Bruschi F, Carratalà J, David M, Drgona L, Djurković-Djaković O, Farinas MC, Genco F, Gkrania-Klotsas E, Groll AH, Guy E, Hirzel C, **Khanna N**, Kurt Ö, Junie LM, Lazzarotto T, Len O, Mueller NJ, Munoz P, Pana ZD, Roilides E, Stajner T, van Delden C, Villena I, Pelloux H, Manuel O. Toxoplasmosis in transplant recipients, Europe 2010-2014. *Emerg Infect Dis*. Aug;24(8):1497-1504, **2018**
- 36) Liu Y, Bai P, Woischnig AK, Charpin-El-Hamri G, Ye H, Folcher M, Xie M, **Khanna N***, Fussenegger M*. Immunomimetic designer cells protect mice from MRSA infection. *Cell*. Jul 12;174(2):259-270.e11, **2018**
*contributed equally to this work
- 37) Kritikos A, Neofytos D, **Khanna N**, Schreiber PW, Boggian K, Bille J, Schrenzel J, Mühlethaler K, Zbinden R, Bruderer T, Goldenberger D, Pfyffer G, Conen A, Van Delden C, Zimmerli S, Sanglard D, Bachmann D, Marchetti O, Lamoth F; Fungal Infection Network of Switzerland (FUNGINOS). Accuracy of Sensititre YeastOne echinocandins epidemiological cut-off values for identification of FKS mutant Candida albicans and Candida glabrata: a ten year national survey of the Fungal Infection Network of Switzerland (FUNGINOS). *Clin Microbiol Infect*. Nov;24(11):1214.e1-1214.e4, **2018**
- 38) Wehrle-Wieland E*, Affolter K*, Goldenberger D, Tschudin Sutter S, Halter J, Passweg J, Tamm M*, **Khanna N*** and Stolz D*. Diagnosis of invasive mold diseases in patients with haematological malignancies using Aspergillus, Mucorales and panfungal PCR in BAL. *Transpl Infect Dis*. Oct;20(5):e12953, **2018** *contributed equally to this work
- 39) Spahr Y, Tschudin-Sutter S, Baettig V, Compagno F, Tamm M, Halter J, Gerull S, Passweg J, Hirsch HH, **Khanna N**. Community-Acquired Respiratory Paramyxovirus Infection After Allogeneic Hematopoietic Cell Transplantation: A Single-Center Experience. *Open Forum Infect Dis*. Apr 12;5(5):ofy077, **2018**
- 40) Kurioka A, Cosgrove C, Simoni Y, van Wilgenburg B, Geremia A, Björkander S, Sverremark-Ekström E, Thurnheer C, Günthard HF, **Khanna N**; Swiss HIV Cohort Study; Oxford IBD Cohort Investigators, Walker LJ, Arancibia-Cárcamo CV, Newell EW, Willberg CB, Klenerman P. CD161 Defines a Functionally Distinct Subset of Pro-Inflammatory Natural Killer Cells. *Front Immunol*. Apr 9;9:486, **2018**
- 41) Naegele K, Lautenschlager I, Gosert R, Loginov R, Bir K, Helanterä I, Schaub S, **Khanna N**, Hirsch HH. Cytomegalovirus sequence variability, amplicon length, and DNase-sensitive non-encapsidated genomes are obstacles to standardization and commutability of plasma viral load results. *J Clin Virol*. Jul;104:39-47, **2018**
- 42) Neofytos D, Chatzis O, Nasioudis D, Boely Janke E, Doco Lecompte T, Garzoni C, Berger C, Cusini A, Boggian K, **Khanna N**, Manuel O, Mueller NJ, van Delden C; Swiss Transplant Cohort Study. Epidemiology, risk factors and outcomes of invasive aspergillosis in solid organ transplant recipients in the Swiss Transplant Cohort Study. *Transpl Infect Dis*. Aug;20(4):e12898, **2018**

- 43) Cremonesi E, Governa V, Garzon JFG, Mele V, Amicarella F, Muraro MG, Trella E, Galati-Fournier V, Oertli D, Däster SR, Droesser RA, Weixler B, Bolli M, Rosso R, Nitsche U, **Khanna N**, Egli A, Keck S, Slotta-Huspenina J, Terracciano LM, Zajac P, Spagnoli GC, Eppenberger-Castori S, Janssen KP, Borsig L, Iezzi G. Gut microbiota modulate T cell trafficking into human colorectal cancer. *Gut*. Nov;67(11):1984-1994, **2018**
- 44) Orasch C, Mertz D, Garbino J, van Delden C, Emonet S, Schrenzel J, Zimmerli S, Damonti L, Mühlethaler K, Imhof A, Ruef C, Fehr J, Zbinden R, Boggian K, Bruderer T, Flückiger U, Conen A, **Khanna N**, Frei R, Bregenzer T, Lamoth F, Erard V, Bochud PY, Calandra T, Bille J, Marchetti O; Fungal Infection Network of Switzerland (FUNGINOS). Fluconazole non-susceptible breakthrough candidemia after prolonged low-dose prophylaxis: a prospective FUNGINOS study. *J Infect*. May;76(5):489-495, **2018**
- 45) Nguyen MT, Uebele J, Nimerta K, Nakayama H, Peter L, Ticha O, Woischnig AK, Schmalzer M, **Khanna N**, Dohmae N, Bok Luel Lee, Bekeredjian-Ding I, and Goetz F. Lipid moieties on lipoproteins of commensal and non-commensal staphylococci induce differential immune responses. *Nat Commun*. Dec 21;8(1):2246, **2017**
- 46) **Khanna N**, Stuehler C. T Cell-Mediated Cross-Protective Immunity. *Methods Mol Biol*. 1625:295-312, **2017**
- 47) Osthoff M, **Khanna N**, Siegemund M. The EMPIRICUS trial-the final nail in the coffin of empirical antifungal therapy in the intensive care unit? *J Thorac Dis*. Mar;9(3):E269-E273, **2017**
- 48) Damonti L, Erard V, Garbino J, Schrenzel J, Zimmerli S, Mühlethaler K, Imhof A, Zbinden R, Fehr J, Boggian K, Bruderer T, Flückiger U, Frei R, Orasch C, Conen A, **Khanna N**, Bregenzer T, Bille J, Lamoth F, Marchetti O, Bochud PY; Fungal Infection Network of Switzerland (FUNGINOS). Catheter retention as a consequence rather than a cause of unfavorable outcome in candidemia. *Intensive Care Med*. Jun;43(6):935-939, **2017**
- 49) Schürmann N, Forrer P, Casse O, Li J, Felmy B, Burgener AV, Ehrenfeuchter N, Hardt WD, Recher M, Hess C, Tschan-Plessl A, **Khanna N**, Bumann D. Myeloperoxidase targets oxidative host attacks to Salmonella and prevents collateral tissue damage. *Nat Microbiol*. Jan 23;2:16268, **2017**
- 50) Martin-Gandul C, Stampf S, Héquet D, Mueller NJ, Cusini A, van Delden C, **Khanna N**, Boggian K, Hirzel C, Soccia P, Hirsch HH, Pascual M, Meylan P, Manuel O; Swiss Transplant Cohort Study (STCS). Preventive Strategies Against Cytomegalovirus and Incidence of α -Herpesvirus Infections in Solid Organ Transplant Recipients: A Nationwide Cohort Study. *Am J Transplant*. Jul;17(7):1813-1822, **2017**
- 51) Priebe M, Widmer J, Suhartha Löwa N, Abram SL, Mottas I, Woischnig AK, Brunetto PS, **Khanna N**, Bourquin C, Fromm KM. Antimicrobial silver-filled silica nanorattles with low immunotoxicity in dendritic cells. *Nanomedicine*. Jan;13(1):11-22, **2017**
- 52) Stuehler C, Bernardini C, Elzi L, Stoeckle M, Zimmerli S, Furrer HJ, Gunthard H, Leibundgut-Landmann S, Battegay M and **Khanna N**. Immune recovery in HIV-infected patients after *Candida* esophagitis is impaired despite long-term antiretroviral therapy. *AIDS*, Jul 31;30(12):1923-33, **2016**
- 53) Syedbasha M, Linnik J, Santer D, O'Shea D, Barakat K, Joyce M, **Khanna N**, Tyrrell DL, Houghton M, Egli A. An ELISA Based Binding and Competition Method to Rapidly Determine Ligand-receptor Interactions. *J Vis Exp*. Mar 14;(109):53575, **2016**
- 54) Kuehl R, Brunetto PS, Woischnig A, Varisco M, Rajacic Z, Vosbeck J, Terracciano L, Fromm KM, **Khanna N**. Preventing implant-associated infections by silver coating. *Antimicrob Agents Chemother*. Mar 25;60(4):2467-75, **2016**
- 55) Estelles A, Woischnig A, Liu K, Stephenson R, Lomongsod E, Nguyen D, Zhang J, Heidecker M, Yang Y, Simon R, Tenorio E, Ellsworth S, Leighton A, Ryser S, **Khanna N*** and Kauvar L*. High Affinity Native Human Antibody Disrupts Biofilm from *Staphylococcus aureus* Bacteria and Potentiates Antibiotic Efficacy in a Mouse Infectious Implant Model. *Antimicrob Agents Chemother*. Mar 25;60(4):2292-301, **2016** *contributed equally to this work
- 56) Ibanescu SA, Nowakowska J, **Khanna N**, Landmann R, Klok HA. Effects of Grafting Density and Film Thickness on the Adhesion of *Staphylococcus epidermidis* to Poly(2-hydroxy ethyl methacrylate) and Poly(poly(ethylene glycol)methacrylate) Brushes. *Macromol Biosci*. May;16(5):676-85, **2016**
- 57) Osthoff M, Wojtowicz A, Tissot F, Jørgensen C, Thiel S, Zimmerli S, Marchetti O, **Khanna N**, Bochud PY, Trendelenburg M; Fungal Infection Network of Switzerland (FUNGINOS); Fungal Infection Network of Switzerland FUNGINOS. Association of lectin pathway proteins with intra-abdominal *Candida* infection in high-risk surgical intensive-care unit patients. A prospective cohort study within the fungal infection network of Switzerland. *J Infect*. Mar;72(3):377-85, **2016**
- 58) Stuehler C, Stüssi G, Halter J, Nowakowska J, Schibli A, Battegay M, Dirks J, Passweg J, Heim D, Rovo A, Kalberer C, Bucher C, Weisser M, Dumoulin A, Hirsch HH, **Khanna N**. Combination therapy for multi-drug resistant cytomegalovirus disease. *Transpl Infect Dis*. Oct;17(5):751-5, **2015**

- 59) Berges C, Bedke T, Lurati S, Stuehler C, **Khanna N**, Kruhm M, Hellerich N, Bargou R, Topp M, Einsele H, Chatterjee R. Combined PI3K/Akt and Hsp90 targeting synergistically suppresses essential functions of alloreactive T cells and increases Tregs. *J Leukoc Biol.* Dec;98(6):1091-105, **2015**
- 60) Nowakowska J, Stuehler C, Egli A, Battegay M, Rauser G, Bantug GR, Brander C, Hess C, **Khanna N**. T cells specific for different latent and lytic viral proteins efficiently control Epstein-Barr virus-transformed B cells. *Cytotherapy.* Sep;17(9):1280-91, **2015**
- 61) Wójtowicz A, Lecompte TD, Bibert S, Manuel O, Rüeger S, Berger C, Boggian K, Cusini A, Garzoni C, Hirsch H, **Khanna N**, Mueller NJ, Meylan PR, Pascual M, van Delden C, Bochud PY; Swiss Transplant Cohort Study. PTX Polymorphisms and Invasive Mold Infections After Solid Organ Transplantation. *Clin Infect Dis.* Aug 15;61(4):619-22, **2015**
- 62) Stuehler C, Kuenzli E, Jaeger VK, Baettig V, Ferracin F, Rajacic Z, Kaiser D, Bernardini C, Forrer P, Weisser M, Elzi L, Battegay M, Halter J, Passweg J, **Khanna N**. Immune reconstitution after allogeneic hematopoietic stem cell transplantation and association with occurrence and outcome of invasive aspergillosis. *J Infect Dis.* Sep 15;212(6):959-67, **2015**
- 63) Stuehler C, Nowakowska J, Bernardini C, Topp MS, Battegay M, Passweg J, **Khanna N**. Multi-specific Aspergillus T cells selected by CD137 or CD154 induce protective immune responses against the most relevant mold infections. *J Infect Dis.* Apr 15;211(8):1251-61, **2015**

2. Peer-reviewed Books/Monographs

None

3. Peer-reviewed Conference Proceedings

None

4. Contributions to Books

Cesaro S, Ragozzino S, **Khanna N**. Polyomavirus, Adenovirus, and Viral Respiratory Diseases. In: Cornely OA, Hoenigl M, editors. *Infection Management in Hematology*. Springer Nature Switzerland; **2021**. p. 191-219.

5. Patents and Licenses

Cross protective epitopes of *Aspergillus fumigatus* and *Candida albicans*.
<https://patents.google.com/patent/WO2012066331A1>

6. Oral Contributions to International Conferences

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|--------------|--|
| 2017–present | Very regular contribution to national and international conferences, e.g. ECCMID, the European Congress of Clinical Microbiology and Infectious Diseases (Meet the expert presentation on virus immunotherapies, infections after hematopoietic cell transplantation: "Difficult treatment scenarios in transplant patients with opportunistic viral infections: a case-based approach") |
| 2020 | World Immunotherapy Conference 2020: "T cell therapy in infectious disease" |

7. Outreach Activities

- | | |
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| 11/2020 – 5/2021 | "Erde am Limit", Naturhistorisches Museum Basel; contribution to the exhibition:
https://www.erdeamlimit.ch |
| 2020 | "Standort Basel: Mit Innovation aus der Antibiotikakrise", movie at the Swiss Innovation Forum |
| 2019 | "Antibiotika und ihre Wirkungsmechanismen – neue Ansätze", lecture within the series "Mikroben unter uns", exhibition General Contributions to Science |

Since 2017, I am an associate professor and leading senior physician in infectious diseases at the University and University Hospital of Basel. I am responsible for transplant infectious diseases treating immunocompromised patients with infectious complications, supervise and train fellows in transplant infectious diseases and establish local management guidelines. I am a member of different national and international boards and support national and international clinical studies in infections in immunocompromised patients (Fungal Infection Network of Switzerland (Funginos), Infectious Diseases Working Group, Swiss Transplant Cohort Study (STCS), ESCMID Study Group for Immunocompromised Hosts and ESCMID Fungal Infection Study Group).

Research group leader at the Department of Biomedicine: Since 2013, I am an independent research group leader. My main responsibility is to acquire grants and supervise undergraduate and graduate students and postgraduate fellows. Based on my clinical expertise, I am interested to identify the underlying mechanisms of host immune control and new treatment approaches against difficult-to-treat infections.

8. Other Artefacts with Documented Use

None