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Mission Statement

“Investing in innovative life science companies for patient benefit, creating attractive returns for entrepreneurs and investors.”
Over the past nine years, we have developed NVF into the world’s largest and very active corporate life science venture fund and we are confident we will maintain our superb performance in the coming years."
Investment Philosophy and Focus

Reinhard Ambros
Global Head of the Novartis Venture Fund

The year 2014 has been an outstanding year for the Novartis Venture Fund (NVF). We realized two major exits with Covagen and Allos BioPharma and had three portfolio companies go public through an IPO process. Our six new investments have been in the early stage of company development and cover several therapeutic areas as well as genomic mapping/diagnostics.

NVF manages over USD 1 bn in committed capital and currently holds investments in more than 40 portfolio companies. We continue our strategy of building a diverse portfolio of life science companies (across biotech, medical devices and diagnostics) and anticipate larger investments of up to USD 30-50 mio per company over its life. We invest in innovations that are strategic to the entire healthcare industry and operate as a financially-driven corporate life science investor.

NVF is stage-agnostic and engages in seed investments as well as later-stage investments including mezzanine financing. We typically lead or co-lead a deal and play an active role on company boards. NVF invests in companies with the potential to change a therapeutic field or explore new business areas. We seek companies in North America, Europe, Israel and Asia/Pacific that are truly innovative and have the potential to offer significant patient benefit. The deep and diverse experience of the fund management team contributes to the success of our portfolio companies. Including the commitment of other syndicate investors, more than USD 2.5 bn is currently invested into NVF portfolio companies.

NVF’s management team, based in Basel, CH and Cambridge, MA, US has worked effectively to build an attractive portfolio of life science companies. Over the past nine years we have developed NVF into the world’s largest and very active corporate life science venture fund and we are confident we will maintain our superb performance in the coming years.
2014 was a particularly outstanding year for NVF with two major divestments (Alios BioPharma and Covagen) and three IPOs. Several factors contributed to this success: first, the quality of its management team that is located in both Europe and in the United States, where the bulk of the innovation is taking place; second, a world-class Advisory Board chaired by Professor Francis Waldvogel for nearly 10 years; third, the concept of an evergreen fund with a hands-off policy from Novartis, allowing the management team to invest in the most promising opportunities for patient benefit and financial return.

As the new chairman of the Advisory Board of NVF, I would like to sincerely thank my predecessor Professor Francis Waldvogel for his outstanding and invaluable contributions. His deep understanding of clinical needs, together with a unique comprehension of science and his extended network, has allowed NVF to position itself in the very competitive world of biomedical science investing. His ‘nose’ for high-potential projects combined with his unique analytical skills and business acumen has undoubtedly contributed to the success of NVF. His chairmanship is an inspiration for a bright future.

We are living in exciting times for biomedical science. The pace of continued technological progress and the emerging convergence between nanotechnology, information technology, biotechnology and cognitive science, provides new opportunities for investment in start-up companies focused on groundbreaking devices, diagnostics and therapies.

I am confident that NVF’s management team, together with its Advisory Board, is ideally placed to capture the most exciting innovations for the ultimate benefit of patients.
Farewell to Prof. Francis Waldvogel

Professor Francis Waldvogel has been chairman of NVF’s Advisory Board for nearly 10 years and an Advisory Board member since NVF’s inception in 1996. Francis supported and helped shape NVF from a small fund to one of the leading, most active and financially successful corporate venture funds with a key focus on developing novel therapeutics, devices and diagnostics.

The Advisory Board members and NVF’s management team greatly appreciate his long term dedication and outstanding contributions to NVF’s success. We thank Francis for his scientific insight combined with his thoughtful approach to assessing the future of medical treatments to help guide NVF investments and support new therapies for patients.

We all wish him the very best in his future endeavors.
M&As 2014

Alios BioPharma, Inc.

**November 2014:** Alios was acquired by Johnson & Johnson (JNJ) for USD 1.75 bn in cash, strengthening JNJ’s existing pipeline in viral diseases. The acquisition included Alios’s portfolio of potential therapeutics for viral infections including compound AL-8176, an orally administered therapy currently in Phase 2 studies for the treatment of infants with respiratory syncytial virus (RSV). In addition, Alios developed a novel proprietary nucleoside/tide library to identify therapeutics for the treatment of several other viral infections including HCV, rhinovirus, norovirus, influenza and other emerging viral diseases.

NVF was one of the original investors in Alios, co-led its Series A preferred financing round in 2008 and participated in all successive financing rounds.

Covagen AG

**August 2014:** Covagen was acquired by Cilag GmbH International, an affiliate of the Janssen Pharmaceutical Companies of Johnson & Johnson. Covagen’s lead product, COVA322, a bispecific anti-tumor necrosis factor (TNF)-alpha/anti-interleukin (IL)-17A FynomAb, is in a Phase 1b study for psoriasis and holds potential as a treatment for a broad range of inflammatory diseases including rheumatoid arthritis. Covagen’s proprietary Fynomer platform creates fully human small binding proteins engineered to bind to target molecules with excellent affinity and specificity. These FynomAb therapeutics may offer enhanced efficacy in the treatment of a broad range of inflammatory diseases.

Covagen was founded in 2009 with seed financing from NVF and MP Healthcare Venture Management and NVF continued to fund Covagen in its successive financing rounds.
IPOs 2014

Akebia Therapeutics, Inc.
www.akebia.com

March 2014: Akebia raised USD 100 mio in its initial public offering on the NASDAQ valuing the company at around USD 350 mio. Akebia’s lead program, AKB-6548, elevates levels of hypoxia inducible factor (HIF) alpha to treat anemia. HIF is the primary regulator of the production of red blood cells in the body and a potentially novel mechanism for treating anemia. Akebia initially seeks to treat patients with kidney disease, both non-dialysis and dialysis patients.

NVF co-led Akebia’s Series A preferred financing in 2008 and participated in all subsequent financing rounds.

Celladon
www.celladon.com

January 2014: Celladon raised USD 44 mio in its initial public offering on the NASDAQ, valuing the company at around USD 180 mio. Celladon’s lead program, MYDICAR uses gene therapy to target sarcoplasmic reticulum Ca²⁺ ATPase, (SERCA2a), which is an enzyme that becomes deficient in patients with heart failure.

Celladon is currently enrolling their Phase 2b study with MYDICAR in heart failure patients. NVF invested in Celladon in 2012.

Tokai Pharmaceuticals
www.tokaipharmaceuticals.com

September 2014: Tokai raised ~ USD 100 mio in its initial public offering on the NASDAQ valuing the company at around USD 350 mio. Tokai’s lead program, galecton, is a triple mechanism androgen signal disrupting agent to help treat men with prostate cancer. Galectone works in three ways: (i) inhibiting CYP17, reducing testosterone synthesis (ii) as an androgen receptor antagonist and (iii) to increase androgen receptor degradation and reduce androgen receptor protein levels in tumor cells which may help patients with mutated androgen receptor status.

NVF co-led Tokai’s Series C/D preferred financing round in 2009 and participated in all subsequent financing rounds.
Partnerships 2014

Forma Therapeutics and Celgene Corporation

**March 2014:** Forma Therapeutics and Celgene Corporation announced a second strategic collaboration and option agreement for up to USD 600 mio that could lead to an acquisition by Celgene.

Forma received an upfront cash payment of USD 225 mio and the parties entered into a collaboration with a term of three and a half years.

Celgene has the option to enter into up to two additional collaborations with terms of two years each for additional payments totaling approximately USD 375 mio. During the third collaboration term, Celgene will have the exclusive option to acquire Forma.

The scope and potential duration of this collaboration, a total of seven and a half years, allows the parties to comprehensively evaluate emerging target families covering a broad range of therapeutic areas for which Forma's platform has exceptional strength.

NVF was the founding investor of Forma in 2008, has participated in successive financing rounds and is represented on the board of directors.
New Investments 2014

Annexion, Inc.

Annexion, located in San Francisco, CA, is developing disease modifying therapeutics to protect neuronal connections (synapses) that are lost in nearly all forms of neurodegenerative disease.

Based on work from the lab of the scientific founder Dr. Ben Barres at Stanford University, Annexion’s platform science is focused on inhibiting C1q as the initiating molecule of the complement cascade responsible for aberrantly binding to functional synapses and triggering their elimination in neurodegenerative disease.

This pathway is also known to contribute to pathology in a number of autoimmune diseases of the nervous system. Annexion’s lead molecule, ANX005, effectively blocks the pathway and will have broad therapeutic application in both acute and chronic neurological diseases. Annexion’s initial focus will be in acute peripheral immune mediated disorders.

Campbell Murray serves on the Board of Directors.

Anokion SA

Anokion is a Swiss biopharmaceutical company based on innovation from the École Polytechnique Fédérale de Lausanne (EPFL) and focused on developing novel engineered proteins with reduced immunogenicity. Their antigen specific immune tolerance technology works by anchoring an antigen to the surface of red blood cells.

This technology is designed for patients suffering from autoimmune diseases harboring immune cells that erroneously recognize naturally occurring self-proteins as foreign. It is also designed as an enzyme therapy by suppressing a patient’s naturally-occurring immunogenicity mounted against a therapeutic enzyme thereby opening a greater therapeutic window.

NVF led the CHF 33 mio Series A preferred financing, which was one of the largest European healthcare Series A financings of 2014.

Florent Gros serves on the Board of Directors.
New Investments 2014

Applied Immune Therapeutics, Inc.

**Applied Immune Therapeutics** is an Israeli biopharmaceutical company based on innovation from the Technion and focused on developing novel antibody therapies targeted to a single intracellular peptide which is naturally presented through the MHC on the human cell surface.

The company is focused on validating new targets, and developing antibodies that are armed (e.g., toxin, T-cell recruitment). This technology has the potential to revolutionize future oncology treatments by allowing high precision targeting of any intracellular oncology protein, therefore opening new potent and untapped oncology therapies.

NVF led the CHF 18 mio Series B preferred financing, which was one of the largest Israeli Series B financings of 2014.

Florent Gros serves on the Board of Directors.

BioNano Genomics, Inc.

**BioNano**, located in San Diego, CA, has developed the Irys genome mapping platform using nanochannel technology to visualize whole genomes of any organism, including humans.

By capturing extremely long DNA molecules at high resolution (hundreds of kilobases vs. single nucleotides), Irys delivers genome maps that provide novel insight into structural variation, such as translocations, amplifications and deletions, that underlies phenotypic variation.

The Irys platform can reveal relevant mutations in complex genomes filling the gap between the available cytogenetics and next-generation sequencing/microarray technologies to further advance genome research.

Campbell Murray serves on the Board of Directors.
New Investments 2014

Forendo Pharma Ltd.

Forendo is a drug development company based in Turku, Finland with an experienced team. Forendo’s core competence is in organ specific hormone mechanisms. The key programs being developed are HSD17B1 enzyme inhibitors, notably FP-5677 a novel specific treatment for endometriosis.

The novel, potent and selective lead compounds have demonstrated in vivo proof of efficacy in a disease models of endometriosis. This new mechanism offers multiple potential benefits over current endometriosis therapies.

Fispemifene, a program with positive Phase 2 data in the treatment of secondary hypogonadism and with disease model data in lower urinary tract symptoms and chronic prostatitis, has been licensed to Apricus Biosciences Inc. concomitantly with the Series A financing.

Anja König serves on the Board of Directors.

Quartet Medicine, Inc.

Quartet is a US based biotechnology company located in Cambridge, MA. Quartet is focused on developing novel inhibitors of the de novo biosynthetic pathway for tetrahydrobiopterin (BH4) for the treatment of neuropathic pain and inflammation.

Quartet’s approach is based upon the pioneering work of its founders at the École Polytechnique Fédérale de Lausanne (EPFL) and Children’s Hospital Boston who identified a human genetic link between enzymes in the de novo pathway for BH4 synthesis and pain, and validated the human genetic findings through animal models using both genetic tools and small molecule inhibitors.

Henry Skinner serves on the Board of Directors.
Exits 2009-2014

**M&As**
- **Alios BioPharma, Inc.**
  Acquired by Johnson & Johnson in 2014
- **Ablation Frontiers, Inc.**
  Acquired by Medtronic in 2009
- **Avila Therapeutics, Inc.**
  Acquired by Celgene in 2012
- **Cequent Pharmaceuticals, Inc.**
  Acquired by MDRNA (now Marina Biotech) in 2010
- **Covagen AG**
  Acquired by Johnson & Johnson in 2014
- **EraGen Biosciences, Inc.**
  Acquired by Luminex Corporation in 2011
- **ESBATech AG**
  Acquired by Alcon in 2009
- **FoldRx Pharmaceuticals, Inc.**
  Acquired by Pfizer in 2010
- **Intellikine, Inc.**
  Acquired by Takeda in 2012
- **LigoCyte Pharmaceuticals, Inc.**
  Acquired by Takeda in 2012
- **Okairos AG**
  Acquired by GSK in 2013
- **Pharmasset, Inc.**
  Acquired by Gilead in 2012
- **Swiss Pharma Contract AG**
  Acquired by Covance in 2009
- **Visiogen, Inc.**
  Acquired by Abbott in 2009

**IPOs**
- **Akebia Therapeutics, Inc.**
  IPO in 2014, NASDAQ: AKBA
- **Celladon Corp.**
  IPO in 2014, NASDAQ: CLDN
- **Cellerix SA**
  Reverse merger into listed TIGenix BV in 2011
- **Evolva Holding SA**
  Reverse merger into listed Arpida AG in 2010
- **Neovacs SA**
  IPO in 2010,Alternext Paris: ALNEV
- **Tokai Pharmaceuticals, Inc.**
  IPO in 2014, NASDAQ: TKAI
Global Portfolio

North America
Advanced Animal Diagnostics
Aeglea Biotherapeutics
Aerpio Therapeutics
Aileron Therapeutics
Akebia
Alios BioPharma
Annexon
Autonomic Technologies
BioNano Genomics
Celladon
eFFECTOR
Euthymics
Forma
Galera
Imagine Ab
Innocrin
Intersection Medical
Neurovance
Proteostasis
Quartet Medicine
Ra Pharmaceuticals
Sonitus Medical
Thesan
Tokai
Trellis RSV Holding
Viamet

Europe and Israel
AMP Therapeutics
Applied Immune Technologies
Atlas Genetics
Bicycle
F2G
Forendo
Gensight Biologics
Heptares
Immune Targeting Systems
Merus Biopharmaceuticals
Nabriva
Opsona

Switzerland
Anokion SA
Covagen AG
Genedata AG
MyoPowers Medical
Symetis AG

Asia-Pacific
Neomics
PharmaAbcine
Qurient
Pipeline Overview of Biotechnology Portfolio

NVF has investments across various therapeutic areas. We seek companies that are truly innovative, have the potential to offer significant patient benefit, have excellent management and are capital-efficient. In total, our current biotechnology portfolio companies have 20 clinical programs in Phase 1 or Phase 2.

<table>
<thead>
<tr>
<th>Therapeutic Area</th>
<th>Pre-clinical</th>
<th>Phase 1</th>
<th>Phase 2</th>
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<tr>
<td>Women’s Health</td>
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</table>
Private Equity Portfolio

40 companies

over 11 countries
Private Equity Portfolio

Advanced Animal Diagnostics, Inc.
www.advancedanimaldiagnostics.com

**Advanced Animal Diagnostics** is an animal health diagnostics company, developing highly accurate, rapid on-farm diagnostics. The QScount® line of on-farm diagnostics will detect disease states at an early stage and optimize management of the reproductive, nutritional and overall health status of production animals, beginning with the dairy cow. The company’s platform diagnostic technology is designed to enhance the profitability of livestock production, improve animal welfare, and ensure a safe, abundant supply of animal protein.

Aeglea Biotherapeutics, Inc.
www.aegleabio.com

**Aeglea** is developing recombinant engineered human enzyme therapies to treat a number of cancer indications such as hepatocellular carcinoma, pancreatic adenocarcinoma, mesothelioma and melanoma. Aeglea’s portfolio of products includes engineered enzymes for the degradation of Arginine, Methionine, Cysteine and Cystine. Each of Aeglea’s products is coupled with a set of predictive biomarkers as part of an overall strategy to drive increased efficacy and patient benefit in a variety of oncology indications with significant unmet clinical needs.

Aerpio Therapeutics, Inc.
www.aerpio.com

**Aerpio** is developing novel small molecule therapies to treat ophthalmic vascular diseases such as diabetic macular edema. Aerpio’s portfolio includes a broad array of human protein tyrosine phosphatase-beta (HPTPB) inhibitors that specifically restore signaling through the endothelium-specific receptor tyrosine kinase TIE-2 pathway to promote vascular stabilization, improved endothelial function and reduced inflammation.

Aileron Therapeutics, Inc.
www.aileronrx.com

**Aileron** is a clinical stage biopharmaceutical company that is developing first-in-class therapeutics based on its proprietary Stapled Peptide drug platform. Aileron aims to dramatically improve the treatment of a wide range of diseases, including cancer, metabolic and endocrine conditions, and positively impact the lives of millions of patients. Aileron’s lead drug development programs are its p53 reactivator for the treatment of cancer, ALRN-6924, and ALRN-5281, a long-acting, growth hormone releasing factor (GRF) for adult growth hormone deficiency that completed a Phase 1 clinical trial in 2013.

AMP Therapeutics GmbH
www.amp-therapeutics.com

**AMP** was founded in 2009 as a spin-out from Prof. Ralf Hoffmann’s laboratory at the University of Leipzig. AMP is developing the next generation of broad-spectrum Gram-negative antibiotics for the treatment of drug-resistant infections. It has been estimated that approximately 30-40% of all hospital-acquired (nosocomial) infections worldwide are caused by Gram-negative bacteria. Gram-negative pathogens are highly genetically flexible and thus develop resistance mechanisms that render most of the current therapies ineffective.
Private Equity Portfolio

Annexion, Inc.
www.annexionbio.com

Annexion is developing disease modifying therapeutics to protect neuronal connections (synapses) that are lost in nearly all forms of neurodegenerative disease. Annexion’s platform is focused on inhibiting C1q as the initiating molecule of the complement cascade responsible for aberrantly binding to functional synapses and triggering their elimination in neurodegenerative diseases. This pathway is also well known to contribute to pathology in a number of autoimmune diseases of the nervous system. Annexion's lead molecule, ANX005, effectively blocks this pathway and will have broad therapeutic application in both acute and chronic neurological diseases. Annexion's initial focus will be in acute peripheral immune-mediated disorders.

Anokion SA
www.anokion.com

Anokion is developing targeted therapeutics by retraining white blood cells to induce therapeutic antigen-specific immune tolerance. Their technology uses the body’s natural immune regulation by engineering proteins to be perceived as "self" entities to treat autoimmune and allergic diseases and to reduce the immunogenicity of therapeutic proteins.

Applied Immune Technologies, Ltd.
www.tcrl.co.il

Applied Immune Technologies (AIT) is a drug development company specializing in T-Cell Receptor-Like (TCRL) antibodies that are targeted to intracellular-derived peptides, which are not always accessible by conventional antibodies, for a variety of therapeutic and diagnostic applications. AIT is also focused on identification and validation of novel therapeutic targets for TCRL antibodies.

Atlas Genetics, Ltd.
www.atlasgenetics.com

Atlas is developing the io™ platform, a highly novel molecular diagnostic system for the ultra-rapid diagnosis of a broad range of infectious diseases using either nucleic acid or immunoassays. The system is fast, ultra-sensitive and designed for use in decentralized laboratories, point-of-care and other near-patient settings, providing a laboratory accurate test result in about 30 minutes.

Autonomic Technologies, Inc.
www.ati-spg.com

Autonomic Technologies is developing a miniaturized implantable neurostimulation device to provide rapid relief from the debilitating pain and suffering caused by severe headaches such as cluster headaches and migraines.
Private Equity Portfolio

Bicycle Therapeutics, Ltd.
www.bicycletherapeutics.com

**Bicycle** has a platform technology to create biotherapeutics combining features of small molecules and biopharmaceuticals. Bicycle Therapeutics is a spin-out from the MRC Laboratory of Molecular Biology based on the work of the founding scientists Sir Gregory Winter and Prof. Christian Heinis.

BioNano Genomics, Inc.
www.bionanogenomics.com

**BioNano** has developed the Irys genome mapping platform using nanochannel technology to visualize whole genomes of any organism, including humans. By capturing extremely long DNA molecules at high resolution (hundreds of kilobases vs. single nucleotides), Irys delivers genome maps that provide novel insight into structural variations, such as translocations, amplifications and deletions, that underlies phenotypic variation. The Irys platform can reveal relevant mutations in complex genomes filling the gap between the available cytogenetics and next-generation sequencing/microarray technologies to further advance genome research.

eFFECTOR Therapeutics, Inc.
www.effector.com

**eFFECTOR** is pioneering a new class of small molecule drugs that act by selectively regulating translation (protein synthesis). The company unites novel insights into the mechanisms of translational control with a proven approach to product invention. eFFECTOR is pursuing selective translation regulators to restore homeostasis to the translation landscape, thereby reversing the consequences of deregulation and offering treatment for a variety of serious conditions.

Euthymics Bioscience, Inc.
www.euthymics.com

**Euthymics** is a clinical stage, biotherapeutic company that is focused on developing therapeutics that help patients achieve euthymia, which means "mood in the normal range". The company's lead compound, amitifadine, is in clinical development for alcohol abuse and depression.

F2G, Ltd.
www.f2g.com

**F2G** is a UK biotechnology company focused on the discovery and development of novel drugs to treat life threatening fungal diseases. F2G is advancing its F3 series of anti-mold compounds. This is a novel class of anti-fungal agent, which acts through a completely new mechanism different from all currently marketed drugs. The F3 series displays highly potent activity against clinically relevant aspergilli and many other important pathogenic molds.
Private Equity Portfolio

Forendo Pharma, Ltd.
www.forendo.com

Forendo is a drug discovery and development company with core competence in tissue specific regulation of sex hormone effects. Its two first-in-class product candidates are in preclinical development with the potential to offer significant therapeutic benefits in men’s and women’s health.

Forma Therapeutics, LLC.
www.formatherapeutics.com

Forma targets essential cancer pathways to create small molecule cancer therapies. Forma leverages the integration of its innovative drug discovery technologies and oncology expertise, enabling efficient screening, discovery and rational development of drug candidates with qualified cellular mechanisms of action. Forma is building a robust pipeline of cancer therapies in areas such as tumor metabolism, protein-protein interactions and epigenetics.

Galera Therapeutics, Inc.
www.galeraTx.com

Galera is a clinical stage drug development company with a portfolio of small molecule superoxide dismutase activators. Superoxide, a product of normal cellular oxygen metabolism and certain environmental stresses, is harmful to DNA, RNA, proteins and lipids. This highly reactive molecule is managed by superoxide dismutases (SODs), but the SOD enzyme is deficient in certain disease states. Galera’s technology replaces this loss of function. The company is initially focusing on radiation-induced mucositis, cancer and pulmonary fibrosis.

Genedata AG
www.genedata.com

Genedata provides computational solutions for drug discovery and systems biology research with a combination of software products and professional services that have been developed in partnership with major pharmaceutical and biotechnology companies.

GenSight Biologics SA
www.gensight-biologics.com

GenSight Biologics is focused on the development of gene therapies in ophthalmic diseases to prevent retinal degeneration in selected pathological conditions and to restore vision in patients suffering from very low vision or blindness.

ImagineAb, Inc.
www.imaginab.com

ImagineAb has a proprietary antibody fragment platform that yields molecular information to guide treatment decisions in cancer and immunology by in vivo imaging. ImaginAb also collaborates with biopharmaceutical partners to design imaging agents as companion diagnostics for therapeutic antibodies.
Private Equity Portfolio

Immune Targeting Systems, Ltd.
www.its-innovation.co.uk

Immune Targeting System (ITS) is developing vaccines for mutating viruses and for immunotherapy in oncology. ITS has influenza Phase 2 challenge studies ongoing and is ready to begin a Hepatitis B therapeutic vaccine clinical study.

Innocrin Pharmaceutical Holdings, LLC.
www.innocrinpharma.com

Innocrin is a clinical stage pharmaceutical company developing novel, “best-in-class” oral, CYP17 lyase inhibitors for the treatment of castration-resistant prostate cancer (CRPC) and potentially other hormonally-driven conditions such as breast cancer, endometriosis, or congenital adrenal hyperplasia.

Intersection Medical, Inc.
www.intersectionmedical.com

Intersection is developing a device to help monitor and manage patients in acute decompensated heart failure. A large and growing cost driver for healthcare systems, acute decompensated heart failure and related hospital re-admissions is a growing area of focus globally. Intersection looks to improve patient outcomes, inform the treatment paradigm, and reduce costs for healthcare systems.

Merus, B.V.
www.merus.nl

Merus leverages its proprietary antibody platform to generate full-length bi-specific IgG antibodies (Biconics®) for oncology. The technology platform leverages fixed VL chains to produce functional monoclonal and bi-specific antibodies in a single cell. Merus has also developed an innovative transgenic mouse platform (MeMo®) and state-of-the-art phage display libraries of human Fab fragments to generate panels of common light chain antibodies.

MyoPowers Medical Technologies SA
www.myopowers.ch

MyoPowers is developing a class III medical implant for the treatment of severe urinary incontinence in males and females, one of the largest under developed therapeutic areas today. MyoPowers aims to enter into CE enabling clinical studies in the near-term.

Nabriva Therapeutics, AG
www.nabriva.com

Nabriva is a specialist antibiotic company with a pipeline of innovative antibacterials for the treatment of serious infections in humans caused by multi-drug resistant pathogens.
Private Equity Portfolio

Neomics Co., Ltd.
www.neomics.com

Neomics is a drug discovery and diagnostics company with a unique cancer target and biomarker discovery platform. In particular, Neomics is focused on novel targets and biomarkers relevant to aminoacyl RNA synthetases (ARS). They have preclinical and clinical validation of their targets and biomarkers.

Neurovance, Inc.
www.neurovance.com

Neurovance is a biopharmaceutical company developing treatments for central nervous system (CNS) disorders. Neurovance’s clinical stage EB-1020 for adult attention deficit hyperactivity disorder (ADHD) is a norepinephrine and dopamine-preferring triple reuptake inhibitor that is expected to be effective for adult ADHD without the addiction potential of other ADHD drugs.

Opsona, Ltd.
www.opsona.com

Opsona is a drug development company focused on novel therapeutic and preventative approaches to inflammatory and related diseases. Opsona has a pipeline of therapeutics in advanced preclinical development that modulates the innate immune system, including biologics and small molecules that target TLR-2 and Nalp-3. Opsona has started Phase 2b clinical studies with the TLR-2 monoclonal antibody to prevent delayed graft function in kidney transplant.

PharmAbcine, Inc.
www.pharmabcine.com

PharmAbcine develops fully human therapeutic monoclonal antibodies for the treatment of cancer and inflammatory diseases. PharmAbcine is a spin-out from Korea Research Institute of Bioscience & Biotechnology (KRIIBB).

Proteostasis Therapeutics, Inc.
www.proteostasis.com

Proteostasis develops novel, small molecule therapeutics designed to control the body’s protein homeostasis, or Proteostasis Network. These therapeutics are designed to treat multiple genetic and degenerative disorders such as Parkinson’s and cystic fibrosis.

Quartet Medicine, Inc.
www.quartetmedicine.com

Quartet is discovering and developing novel treatments for chronic pain and inflammation. Human genetics and preclinical target validation data point to increased tetrahydrobiopterin (BH4) as a critical mediator of peripheral nerve dysfunction and immune cell regulation. Quartet is capitalizing on these insights by safely restoring BH4 homeostasis in neuronal and inflammatory cells.
Private Equity Portfolio

Qurient Therapeutics, Inc.
www.qurient.com

Qurient is a spin-off biotechnology company from Institut Pasteur Korea (IP-K) committed to developing novel therapeutics against infectious diseases. Qurient’s main focus is on HIV, HCV and TB infection. Qurient has exclusive rights to develop and commercialize drug candidates discovered with IP-K’s proprietary state-of-the-art technologies including the PhenomicScreen™ and PhenomicID™ platforms.

Ra Pharmaceuticals, Inc.
www.raapharma.com

Ra uses proprietary combinatorial assembly and in vitro display technologies to discover macrocyclic compounds with enhanced bioavailability targeting a wide range of intracellular, cell-surface, and circulating proteins. Ra’s initial focus is on orally available replacements for a variety of marketed biologics, as well as drugs targeting intracellular protein-protein interactions.

Sonitus Medical, Inc.

Sonitus Medical developed an FDA approved medical device for the treatment of single-sided deafness and conductive hearing loss using the principal of bone conduction. It is the first non-surgical and removable hearing solution that relies on bone conduction.

Symetis AG
www.symetis.com

Symetis is successfully marketing a transapical catheter-mediated delivery system for the beating heart to insert stented mechanical valves for application in cardiac valve replacement.

Thesan Pharmaceuticals, Inc.
www.thesanpharma.com

Thesan is developing innovative therapeutics for dermatological applications. The company is currently developing topical applications of novel chemical entities against novel targets for atopic dermatitis and acne.

Trellis RSV Holdings, Inc.
www.trellisbio.com

Trellis is leveraging its proprietary CellSpot™ technology to deliver higher quality therapeutic monoclonal antibodies. The company has programs in infectious disease.

Viamet Pharmaceutical Holdings, LLC.
www.viamet.com

Viamet is a clinical stage biotechnology company that discovers and develops “best-in-class” small molecule inhibitors of validated metalloenzymes via an innovative metal binding approach, its proprietary Metallophilic® Technology. The company develops traditional small molecule compounds that exploit validated metalloenzyme targets in the field of infectious disease.
Medical Devices and Diagnostics

“...We currently have targeted 20% of our fund to medical device and diagnostic opportunities.”
Medical Devices and Diagnostics

Seeking the best clinical solution and looking broadly at healthcare innovation, physicians use a combination of technologies to produce the best clinical outcome. The challenges and opportunities in healthcare are multi-factorial. NVF looks broadly to invest in all types of healthcare innovation that will serve clinical need. NVF has invested in medical technologies and diagnostics since its inception in 1996. Our device investments are led by Steven Weinstein in our Cambridge, MA office.

We currently have targeted 20% of our fund to medical device and diagnostic opportunities.

Our Focus

Our definition of medical technologies is broad. NVF seeks opportunities that can change the practice of medicine, produce meaningful patient benefit, or reduce costs of medical care.

We look for underserved indications, or where a company’s technology enables a new treatment paradigm.

In today’s more cost-conscious healthcare environment, we also look for companies whose technologies allow the healthcare system to reduce overall cost while maintaining or improving outcomes.

Our investment strategy is stage-agnostic (seed to growth capital) and we are happy to lead an investment, and invest globally.

Investment Activity

In 2014, we made one new medical device investment. BioNano Genomics, located in San Diego, CA, which has developed the Irys genome mapping platform using nanochannel technology to visualize whole genomes of any organism, including humans.

By capturing extremely long DNA molecules at high resolution (hundreds of kilobases vs. single nucleotides), Irys delivers genome maps that provide novel insight into structural variation, such as translocations, amplifications and deletions, that underlies phenotypic variation.

The Irys platform can reveal relevant mutations in complex genomes filling the gap between the available cytogenetics and next-generation sequencing/microarray technologies to further advance genome research.

Current Portfolio

**Advanced Animal Diagnostics:**
On-farm diagnostic for animal health

**Atlas Genetics:**
Rapid point-of-care diagnostic for infectious diseases

**Autonomic Technologies:**
Neurostimulator for the treatment of severe headache

**BioNano Genomics:**
Genome mapping

**Sonitus Medical:**
Prosthetic for single-sided deafness

**Symetis:**
Percutaneous and transapical heart valves

**Intersection Medical:**
Monitoring device for acute decompensated heart failure
Fund Management

Dr. Reinhard J. Ambros
Basel, Switzerland

Dr. Reinhard J. Ambros is the Global Head of NVF, in Basel, Switzerland. Previously, he was Managing Director of the Novartis BioVenture Fund in the USA. He also worked with Novartis Corporate Finance where he held the position of Head of Group Strategic Planning for several years. He was responsible for post-merger integrations at Novartis Corporate M&A and was Global Head Business Development & Licensing for cardiovascular and metabolic diseases at Novartis Pharmaceuticals. Earlier in his career he held global leadership positions for key drug development projects at Novartis and Roche. He trained as a pharmacist, has a PhD in medicinal chemistry and pharmacology and focused postdoctoral training in clinical pharmacology. Reinhard serves on the boards of Aerpio, Aileron, Forma, Genedata and Symetis.

Dr. Christine Brennan
Cambridge, MA, USA

Dr. Christine Brennan is a Principal in Cambridge, MA, USA. Prior to joining NVF, she was Chief Business Officer at Vitae Pharmaceuticals. Previously, she was Executive Director and Head of Strategy & Operations in Strategic Alliances with Novartis Institutes of Biomedical Research. Prior to this, she held positions in biotechnology and mid-size pharma companies in business development and marketing at EnVivo Pharmaceuticals, Biovail Corp. and Cogent Neurosciences and was a Director at the venture capital company Fidelity Biosciences Group. She received her PhD in neuroscience from Dartmouth Medical School and completed a postdoctoral fellowship in developmental neurobiology at the National Institutes of Health.

Bart Dzikowski
Basel, Switzerland

Bart Dzikowski is the Head of Legal for NVF in Basel, Switzerland. During his time with Novartis, he has served as the Head of Corporate Legal M&A (a.i.) and as Senior Business Development & Licensing/M&A Counsel. Before joining Novartis in 2009, Bart was Vice President with the Investment Banking Division of Bank of America/Merrill Lynch in New York and, before that, he was an associate with the Corporate/M&A Group at the law firm of Allen & Overy LLP in New York. Bart holds degrees in common law (LL.B.) and civil law (B.C.L.) from McGill Law School in Canada and is a member of the New York State Bar.
Fund Management

Giovanni Ferrara
Cambridge, MA, USA

*Giovanni Ferrara* is a Venture Partner in Cambridge, MA, USA. Prior to joining NVF, he was a consultant to leading west coast venture capital firms and portfolio companies. Most recently, Giovanni was consulting Chief Business Officer to Sorbent Therapeutics. Previously, he was Managing Director and General Partner at Burrill & Company and began his venture capital career at GeneChem Management, where in addition to investing, he held operating positions in portfolio companies, including CEO of Targanta Therapeutics (then PhageTech, Inc.). He began his career in healthcare as a pharmacist at a cancer treatment center researching experimental therapies. He received his MBA and MSc from McGill University. Giovanni serves on the board of Thesan Pharmaceuticals.

Dr. Markus Goebel
Basel, Switzerland

*Dr. Markus Goebel* is a Managing Director in Basel, Switzerland. Prior to joining NVF, he worked as Head Novartis Pharmaceutical Corporate M&A and Head Nervous System Business Development & Licensing. A physician by training and certified, amongst others, in hematology/oncology, Markus worked for Farmitalia Germany and later held several positions in R&D, Marketing and Strategy at Roche headquarters before joining Novartis. Markus received an MD and a PhD from the Ludwig Maximilian’s University in Munich and an MBA from Henley. Markus serves on the boards of eFFECTOR, Ra Pharmaceuticals and Trellis RSV Holdings.

Florent Gros
Basel, Switzerland

*Florent Gros* is a Managing Director in Basel, Switzerland. Prior to joining NVF, he worked in various global leadership positions in intellectual property and transaction matters at Nestlé, Pasteur Merieux Connaught (Sanofi Pasteur) and Novartis, in Europe and North America. Florent is a Kaufmann Fellow (2012) and holds a Biotechnology Engineering Masters Degree from France, and did his diploma thesis on vaccines at GSK in Belgium. He also holds European and French patent lawyer degrees and a Masters in Private Law. Florent serves on the boards of AIT, Atlas Genetics, Gensight Biologics, Immune Targeting Systems, Merus, MyoPowers and Opsona.
Fund Management

Dr. Anja König
Basel, Switzerland

Dr. Anja König is a Managing Director in Basel, Switzerland. She is active in the UK, Switzerland and the rest of Europe. Prior to joining NVF, she was an Associate Partner at McKinsey and Company in New York, a global consultancy, where she worked with healthcare companies in the US, Europe and Emerging Markets. Anja holds a PhD in physics from Cornell University. She serves on the boards of Bicycle Therapeutics, F2G and Forendo Pharma.

Dr. Campbell Murray
Cambridge, MA, USA

Dr. Campbell Murray is a Managing Director in Cambridge, MA, USA. Prior to joining NVF, he worked at the Novartis Institutes for BioMedical Research as the Director of Special Projects. Campbell is a New Zealand-trained physician and worked as a Medical House Officer at Auckland Hospital. He is a Kauffman Fellow and holds an MBA from Harvard Business School and an MPP (public policy) from the John F. Kennedy School of Government, where he was a Knox Fellow and Rotary Ambassadorial Scholar. Campbell serves on the boards of Aerpio, Annexon, BioNano Genomics, Euthymics, Galera, ImaginAb and Neurovance.

Dr. Lauren Silverman
Cambridge, MA, USA

Dr. Lauren Silverman is a Managing Director in Cambridge, MA, USA. Prior to joining NVF, she was Global Head of Oncology Research Operations for Novartis Institutes for Biomedical Research. Prior to Novartis, she was Director of Business Development and Licensing at Pfizer and OSI Pharmaceuticals. Lauren was also a founding scientist of Cadus Pharmaceuticals. She earned her PhD in molecular biology from the University of Utah, followed by fellowships at Princeton and Memorial Sloan Kettering.
Fund Management

Dr. Henry Skinner
Cambridge, MA, USA

**Dr. Henry Skinner** is a Managing Director in Cambridge, MA, USA. Prior to joining NVF, he worked as Executive Director & Global Head Strategic Alliances at the Novartis Institutes for Biomedical Research where he led a team responsible for identification, negotiation and management of collaborations and licenses for Novartis’ therapeutic technology areas. Prior to joining Novartis he was CEO of SelectX Pharmaceuticals and President and CEO of NeoGenesis Pharmaceuticals, which was acquired by Schering-Plough. He was Director of Technology Acquisitions for Pharmacia & Upjohn and managed business development and licensing for research platforms and therapeutic areas worldwide. Prior to Pharmacia, he was Director of Business Development at Lexicon Genetics. He was a postdoctoral fellow at Baylor College of Medicine and earned his PhD in Microbiology and MS in Biochemistry from the University of Illinois. Henry serves on the boards of Aeglea, AMP Therapeutics, Galera, Proteostasis and Quartet Medicine.

Steven D. Weinstein
Cambridge, MA, USA

**Steven D. Weinstein** is a Managing Director in Cambridge, MA, USA. Steve focuses on both medical device and therapeutic investments for the fund. Prior to joining NVF, he was a Principal at Prism Venture Partners where he focused on medical devices. Prior to Prism, Steve was a Principal and Kauffman Fellow with Mid-Atlantic Venture Funds. He started his career as turnaround CEO, raising angel funds to buy the assets of a defunct distribution business out of bankruptcy and subsequently rebuilding the business. Steve holds an MBA with distinction from the University of Michigan Business School and a B.S. in mechanical engineering from Columbia University’s School of Engineering and Applied Science. He serves on the Partner’s Healthcare Innovation Advisory Board and the University of Michigan Wolverine Venture Fund Advisory Board. Steve serves on the boards of Advanced Animal Diagnostics, Autonomic Technologies, Innocrin, Intersection Medical, Sonitus Medical and Viamet.
Directors of

Prof. Patrick Aebischer
Chairman of Advisory Board
President of the École Polytechnique Fédérale de Lausanne (EPFL) and Professor of Neurosciences. Member of the Board of Lonza and the Nestlé Health Science Company.

Prof. Michel Aguet
Director of Advisory Board
Professor School of Life Sciences, École Polytechnique Fédérale de Lausanne (EPFL); former Director of the Swiss Institute for Experimental Cancer Research (ISREC); Director of the National Center of Competence in Research (NCCR) in Molecular Oncology.

Prof. Paul Herrling
Director of Advisory Board
Chairman, Novartis Institute for Tropical Diseases.

Harry Kirsch
Director of Advisory Board
Chief Financial Officer (CFO) of Novartis and member of the Executive Committee of Novartis (ECN).

Prof. Jean-Marie Lehn
Director of Advisory Board
Nobel Prize Winner for Chemistry, Collège de France, Paris, Université Louis Pasteur, Strasbourg, France.
Advisory Board

Prof. Daniel Louvard
Director of Advisory Board
Director of Research, Institut Curie, Paris, France.

Prof. Christoph A. Meier
Director of Advisory Board
Chief, Department of Internal Medicine and Specialties, Triemli Hospital Zurich, and Associate Professor, Medical Faculty, University of Geneva.

Dr. Raj Parekh
Director of Advisory Board
General Partner at Advent Venture Partners, London, UK.

Prof. Hidde Ploegh
Director of Advisory Board
Professor of Biology, Massachusetts Institute of Technology; Member, Whitehead Institute for Biomedical Research.
Contact Information

Please contact one of our offices closest to the company site for an initial review. We have offices in Basel, Switzerland and Cambridge, MA, USA and entrepreneurs should contact the office closest to their company.

Cambridge, Massachusetts
Claire McNulty
Office Manager
Novartis Venture Fund
355 Main Street, Suite 603
Cambridge, MA 02142, USA
Phone: +1 617 871 3536
claire.mcnulty@nvfund.com

Basel, Switzerland
Martina Blank
Office Manager
Novartis Venture Fund
c/o Novartis International AG
Postfach CH-4002 Basel, Switzerland
Phone: +41 61 324 3267
martina.blank@nvfund.com

For Media Inquiries, please contact:
Erik Petersen
Novartis Communications
Postfach CH-4002 Basel, Switzerland
Phone: +41 61 324 8738
erik.petersen@novartis.com

For more information, you can also visit: www.nvfund.com