CURRICULUM VITAE

Stephanie Traub, Dr. rer. nat.

Education

2011: **PhD in biology**
Department of life science, Universität zu Köln, Germany.
Title: Interplay between vascular endothelial growth factor-A and extracellular matrix in angiogenesis: molecular and cellular mechanisms (Magna cum laude, Dr. rer. nat.).
Supervisor: Professor Dr. med. Sabine Eming
Examiners: Professor Dr. Matthias Hammerschmidt
Professor Dr. Mats Paulsson

2006: **Diplom in biology (masters)**
Department of life science, Johann-Wolfgang-Goethe Universität, Frankfurt (Main), Germany.
Diploma thesis: Interaktionspartner der Reggie-Proteine (Interaction partners of the reggie-proteins).
Supervisor: Professor Dr. Ritva Tikkanen
Examination subjects: Cell and developmental biology
Toxicology
Anthropology

2003: **Vordiplom in biology (bachelors)**
Department of life science, Johann-Wolfgang-Goethe Universität, Frankfurt (Main), Germany.

Research Experience

May 2011 - April 2012: **Postdoctoral fellow**
Department of dermatology, Universitätsklinik Köln, Germany.
Supervisor: Professor Dr. med. Sabine Eming
Investigation of time- and dose-response of blood vessel growth in full-thickness skin wounds in diabetic mice in response to bio-engineered fusion-proteins delivered via sequestration in fibrin gels; examination of integrin clustering during cell spreading on surfaces functionalized with recombinant proteins.

November 2006 – May 2011: **PhD studies**
Department of life science, Universität zu Köln, Germany.
June 2009 – May 2011: Department of dermatology, Universitätsklinik Köln, Germany.
Supervisor: Professor Dr. med. Sabine Eming
November 2006 – June 2009 (research visit): Laboratory for regenerative medicine and pharmacobiology, École Polytechnique Fédérale de Lausanne, Switzerland.
Collaborator: Professor Dr. Jeffrey Hubbell
Designed and expressed a modified vascular endothelial growth factor (VEGF) molecule equipped with a cell binding domain that conserved its structural and functional integrity as shown by circular dichroism spectroscopy, surface plasmon resonance analysis, and VEGFR-2 phosphorylation. Chemical crosslinking of ligand-receptor complexes on human umbilical vein endothelial cells demonstrated the fusion protein's binding to VEGFR-2 and integrin $\alpha v\beta 3$. This receptor crosstalk promoted enhanced spreading of endothelial cells on cell culture dishes coated with the recombinant proteins. To assess the bio-engineered VEGF molecule's potential in the promotion of angiogenesis in a pre-clinical animal model, it was covalently bound to fibrin and delivered to full-thickness punch biopsy wounds in diabetic mice. Wound closure was accelerated and the vessel density was increased as compared to wounds treated with fibrin only.
Methods: Design, cloning and purification of recombinant proteins, protein expression in *E. coli* and HEK293-EBNA cells, bio-functionalization of fibrin gels with a growth factor for targeted delivery, bioactivity assays using human umbilical vein endothelial cells (activation

of signaling molecules by western blot, ELISA and G-LISA, cell attachment assay), BIACORE, confocal microscopy, investigation of the angiogenic response to growth factor-functionalized fibrin gels in full-thickness punch biopsy wounds.

November 2005 - July 2006: **Diploma thesis project**
Institut für Biochemie II, Klinikum der Johann-Wolfgang-Goethe Universität, Frankfurt (Main), Germany.
Supervisor: Professor Dr. Ritva Tikkanen
By yeast-two hybrid screening, novel interaction partners for reggie-1 and -2 involved in the regulation of actin- and focal contact dynamics, as well as in cellular signal transduction were identified.
Methods: Yeast-two hybrid system, molecular cloning, membrane fractionation, western blotting.

Publications:

Traub S, Morgner J, Martino MM, Höning S, Swartz MA, Wickström SA, Hubbell JA, Eming SA. 2013. The promotion of endothelial cell attachment and spreading using FNIII10 fused to VEGF-A165. Biomaterials 34(24):5958-5968.

Tomasovic A, **Traub S**, Tikkanen R. 2012. Molecular networks in FGF signaling: flotillin-1 and cbl-associated protein compete for the binding to fibroblast growth factor receptor substrate 2. PLoS One 7(1):e29739.

Martino MM, Tortelli F, Mochizuki M, **Traub S**, Ben-David D, Kuhn GA, Muller R, Livne E, Eming SA, and Hubbell JA. 2011. Engineering the growth factor microenvironment with fibronectin domains to promote wound and bone tissue healing. Sci Transl Med 3(100):100ra189.

Traub S, Lucas T, Hoffmann DC, Krieg T, Eming SA. 2010. Design of a novel protease-resistant vascular endothelial growth factor-A protein for angiogenic therapy. *Yearbook of the American Wound Healing Society*; Advances in wound care: 1 (58, 341-346).

Conference/Meeting Presentations:

Traub S, Hoffmann DC, Morgner J, Martino MM, Koch M, Becker A, Höning S, Wagener R, Wickström S, Hubbell JA, Eming SA. Fusion of FNIII10 to VEGF-A_{165} promotes endothelial cell attachment and spreading. Biomedica, Aachen, June 2013. Poster presentation.

Traub S, Hoffmann DC, Morgner J, Martino MM, Koch M, Becker A, Höning S, Wagener R, Wickström S, Hubbell JA, Eming SA. Agonistic VEGF-variants engineered to simultaneously bind to and stimulate VEGFR-2 and alphaVbeta3 integrin. Annual meeting of Arbeitsgemeinschaft Dermatologische Forschung (Working group of dermatological research), Marburg, March 2012. Poster presentation. *Poster prize.*

Traub S, Lucas T, Hoffmann DC, Morgner J, Martino MM, Koch M, Becker A, Höning S, Wagener R, Wickström S, Hubbell JA, Eming SA. Bio-engineered VEGF-variants binding VEGFR-2 and integrin $\alpha v\beta 3$ for pro-angiogenic therapies. Annual EU-project meeting Angioscaff, Lausanne, Februar 2012. Oral and poster presentation.

Traub S, Hoffmann DC, Martino MM, Koch M, Hubbell JA, Eming SA: VEGF-isoforms for tissue regeneration. Annual EU-project meeting Angioscaff, Barcelona, December 2010. Oral and poster presentation.

Traub S, Eming SA. Bioengineering approaches towards the treatment of chronic wounds. TOPEA Online Seminar, September 2010. Oral presentation.

Traub S, Hoffmann DC, Martino MM, Lorentz K, Bonvin C, Ziogas A, Ehrbar M, Zisch A, Swartz M, Hubbell JA, Eming SA. VEGF-isoforms for tissue regeneration. Annual EU-project meeting Angioscaff, Zürich, December 2009. Oral and poster presentation.