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Molecular and cellular characterization of cardiac overload-induced hypertrophy and failure

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List of publications

- **Umar S**, Steendijk P, de Visser YP, Wagenaar GTM, Schutte CI, Bax WH, Pijnappels DA, Atsma DE, Schalij MJ, van der Wall EE, van der Laarse A. Intravenous cell therapy given to rats with monocrotaline-induced pulmonary artery hypertension reduces right ventricular hypertrophy and improves right ventricular function by restoring precapillary pulmonary artery patency (abstract). *Journal of American College of Cardiology* 2009; 53: A144-A197.
- **Umar S**, de Visser YP, Steendijk P, Schutte CI, Laghmani E, Wagenaar GTM, Bax WH, Mantikou E, Pijnappels DA, Atsma DE, Schalij MJ, van der Wall EE, van der Laarse A. Stem cell therapy attenuates right ventricular pressure overload, hypertrophy, and dysfunction by improving lung pathology in rats with pulmonary hypertension. *Submitted*, 2009.
- **Umar S**, van der Valk EJM, Schalij MJ, van der Wall EE, Atsma DE, van der Laarse A. Integrin stimulation-induced hypertrophy in neonatal rat cardiomyocytes is NO-dependent. *Molecular and Cellular Biochemistry* 2009;320:75-84.
- **Umar S**, van der Laarse A. Nitric oxide and nitric oxide synthase isoforms in the normal, hypertrophic and failing heart. *Submitted*, 2009.
- **Umar S**, Steendijk P, Ypey DL, Atsma DE, van der Wall EE, Schalij MJ, van der Laarse A. Novel approaches to treat pulmonary arterial hypertension. *Submitted*, 2009.
- Li Z, **Umar S**, Van der Valk EJM, Bax WH, Schutte CI, van der Laarse A. Integrin stimulation favors uptake of macromolecules by cardiomyocytes *in vitro*. *Submitted*, 2009.
- **Umar S**, Bax JJ, Klok M, van Bommel RJ, Hessel MHM, den Adel B, Bleeker GB, Henneman MM, Atsma DE, van der Wall EE, Schalij MJ, van der Laarse A. Myocardial collagen metabolism in failing hearts before and during cardiac resynchronisation therapy. *European Journal of Heart Failure* 2008;10:878-883.
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- **Umar S**, Hessel M, Steendijk P, Bax W, Schutte C, Schalij M, van der Wall E, Atsma D, van der Laarse A. Activation of signaling molecules and matrix metalloproteinases in right ventricular myocardium of rats with pulmonary hypertension. *Pathology - Research and Practice* 2007; 203: 863-872.

- **Umar S**, Bax JJ, Klok M, Hessel MHM, den Adel B, Bleeker GB, Henneman MM, Atsma DE, van der Wall EE, Schalij MJ, van der Laarse A. Myocardial collagen metabolism in failing hearts before and during cardiac resynchronisation therapy (abstract). *Circulation* 2007; 116:II_690.
- **Umar S**, Hessel MH, Bax WH, Schutte CI, Steendijk P, van der Laarse A. Activation of focal adhesion kinase and neuronal nitric oxide synthase in right ventricular myocardium of rats with right-sided congestive heart failure (abstract). *Journal of American College of Cardiology* 2006; 47; 387A-418A.

Oral and poster presentations at international scientific conferences

- Poster presentation at **EUROPACE** conference in Berlin, Germany. Titled, "Making an extra beat: studying cellular arrhythmogenic activity with a computer model". van Meerwijk WPM, Umar S, van der Laarse A Pijnappels DA, Schalij MJ, Ypey DL, June 2009.
- Poster presentation at **The Netherlands Heart Society (NVVC)** Spring congress in Amsterdam, the Netherlands. Titled, "Intravenous administration of mesenchymal stem cells improves right ventricular function and restores right ventricular troponin I concentration in rats with pulmonary hypertension". Hoek TGT, Umar S, Steendijk P, Schutte CI, Bax WH, Pijnappels DA, Atsma DE, Schalij MJ, van der Wall EE, van der Laarse A, April 2009.
- Poster presentation at **The American College of Cardiology (ACC)** 58th Annual Scientific Sessions in Orlando, FL, USA, March 2009. Titled, "Intravenous cell therapy given to rats with monocrotaline-induced pulmonary artery hypertension reduces right ventricular hypertrophy and improves right ventricular function by restoring precapillary pulmonary artery patency". **Umar S**, Steendijk P, de Visser YP, Wagenaar GTM, Schutte CI, Bax WH, Pijnappels DA, Atsma DE, Schalij MJ, Van der Wall EE, van der Laarse A.
- Poster presentation at **The Netherlands Heart Society (NVVC)** Spring congress in Amsterdam, the Netherlands. Titled, "Intravenous cell therapy reduces right ventricular hypertrophy and right ventricular pressure overload in rats with pulmonary artery hypertension". **Umar S**, Steendijk P, Wagenaar GTM, Schutte CI, Bax WH, Pijnappels DA, Schalij MJ, van der Wall EE, Atsma DE, van der Laarse A, April 2008.

- Poster presentation at **The American College of Cardiology (ACC) 57th** Annual Scientific Sessions in Chicago, IL, USA, March 2008. Titled, "Integrin stimulation-induced hypertrophy in neonatal rat cardiomyocytes is NO-dependent". **Umar S**, van der Valk EJM, SchaliJ MJ, van der Wall EE, Atsma DE, van der Laarse A.
- Oral presentation at **The American Heart Association (AHA)** Annual Scientific Sessions in Orlando, FL, USA, November 2007. Titled, "Myocardial collagen metabolism in failing hearts before and during cardiac resynchronisation therapy". **Umar S**, Bax JJ, Klok M, Hessel MHM, den Adel B, Bleeker GB, Henneman MM, Atsma DE, van der Wall EE, SchaliJ MJ, van der Laarse A.
- Poster Presentation at **American College of Cardiology (ACC) 55th** Annual Scientific Sessions in Atlanta, GA, USA, March 2006. Titled, "Activation of Focal Adhesion Kinase and neuronal Nitric Oxide Synthase in right ventricular myocardium of rats with right-sided congestive heart failure". **Umar S**, Hessel MHM, Bax WH, Schutte CI, Steendijk P, van der Laarse A.
- Oral Presentation at **The National Institute of Cardiovascular diseases (NICVD)** International Congress of Cardiology in Karachi, Pakistan, December 2005. Titled, "Activation of signaling molecules and matrix metalloproteinases in right ventricular myocardium of rats with pulmonary hypertension". **Umar S**, Hessel MHM, Bax WH, Schutte CI, Steendijk P, van der Laarse A.
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Curriculum vitae

Soban Umar, the author of this thesis, was born on June 24, 1979 in Multan, Pakistan. He completed his pre-medical studies from Govt. College Multan in 1997, standing 2nd in the board of Intermediate and Secondary Education. He completed his Bachelors in Medicine and Bachelors in Surgery (M.B.B.S) degree in 2002 with distinction from Nishtar Medical College Multan, Pakistan, securing first position in both the college as well as Bahauddin Zakariya University, Multan, Pakistan. He worked as a House Officer in the Departments of Surgery, Dermatology and Family Medicine of Nishtar Hospital Multan, Pakistan (2002-2005).

He passed the United States Medical Licensing Examinations (USMLE) Step-1 (2003), Step-2 Clinical knowledge (2004) and Step-2 Clinical Skills (2005) and became a certified M.D. by the Educational Commission for Foreign Medical Graduates, (ECFMG[®]) Philadelphia, PA, USA in 2005.

In 2005, he won the foreign PhD scholarship from the Higher Education Commission (HEC) of Pakistan and the Netherlands Organization for International Cooperation in Higher Education (NUFFIC) for completing a Doctoral Research Fellowship in Cardiology in The Netherlands. He pursued his PhD research at the Department of Cardiology, Leiden University Medical Center (LUMC), Leiden, the Netherlands (2005-2009) under the supervision of Prof.dr. A. van der Laarse. He has presented his research in prestigious conferences of Cardiology held in Atlanta (GA, USA), Orlando (FL, USA), Chicago (IL, USA), Karachi (Pakistan), Ermelo and Amsterdam (the Netherlands). He has been able to get his research papers published in international peer-reviewed journals.

