Antonio Rossi
Short biographical sketch

Prof. Antonio Rossi got his degree in Biology at the University of Pavia in 1985 and the PhD in Biochemistry in 1992. He was researcher at the Department of Biochemistry of the University of Pavia from 1994 to 2001 and starting from 2001 till present he is Associate Professor in Biochemistry at the Dept. of Molecular Medicine, Unit of Biochemistry, of the University of Pavia.

Research interest:

Most of the bones of our skeleton including the long bones and digits develop and grow by way of a cartilage template in a process called endochondral ossification. Disruptions to this process result in a heterogeneous group of genetic diseases known as chondrodysplasias a group of skeletal dysplasias characterized predominantly by short-limb dwarfism often associated with early-onset osteoarthritis causing joint failure and significant pain. Among the 450 unique and well characterized phenotypes that range in severity from mild to lethal forms, prof. A. Rossi research is mainly focused on chondrodysplasias caused by defects in proteoglycan and glycosaminoglycan metabolism. His studies are aimed at understanding how cartilage ECM proteins function, defining the mechanisms by which mutations in cartilage proteins cause chondrodysplasias and osteoarthritis.

To pursue this goal relevant cellular models (chondrocyte, osteoblast and fibroblast cultures) and animal models (transgenic animals) are generated and studied using molecular, biochemical and morphological approaches.

Current research topics:

- mutation screening in Diastrophic dysplasia patients;
- characterization using a knock-in mouse model (dtd mouse) the molecular basis of the "diastrophic dysplasia" family of disorders caused by defects in a sulfate transporter resulting in proteoglycan undersulfation;
- testing pharmacological therapies of Diastrophic dysplasia using the dtd mouse;
- characterization of the molecular basis of Desbuquois dysplasia caused by mutations in CANT1, involved in proteoglycan metabolism, using knock-in and knock-out mice;
- biochemical studies in patients with mutations in genes involved in proteoglycan and glycosaminoglycan metabolism.

Defining precisely the mechanisms by which these diseases develop has the potential to highlight new opportunities for treatment which is the long-term goal of all of these studies.

During these years prof. A. Rossi has produced about 65 publications on peer-review journals.

He has been the principal investigator in four Telethon projects, four MIUR (PRIN) grants, a grant from Fondazione Cariplo and he has been involved in a European Research Project (FP6 - EuroGrow) aimed at the characterization of several mouse models of chondrodysplasias.

Relevant papers of the last 5 years:

1. Gualeni, B., de Vernejoul, M.-C., Marty-Morieux, C., De Leonardis, F., Franchi, M., Monti, L., Forlino, A., Houillier, P., Rossi, A., Geoffroy, V. Alteration of proteoglycan sulfation affects bone growth and remodeling. (2013) Bone, 54 (1), pp. 83-91.

2. Nizon, M., Huber, C., De Leonardis, F., Merrina, R., Forlino, A., Fradin, M., Tuysuz, B., Abu-Libdeh, B.Y., Alanay, Y., Albrecht, B., Al-Gazali, L., Basaran, S.Y., Clayton-Smith, J., Désir, J., Gill, H., Greally, M.T., Koparir, E., van Maarle, M.C., MacKay, S., Mortier, G., Morton, J., Sillence, D., Vilain, C., Young, I., Zerres, K., Le Merrer, M., Munnich, A., Le Goff, C., Rossi, A., Cormier-Daire, V. Further delineation of CANT1 phenotypic spectrum and demonstration of its role in proteoglycan synthesis. (2012) Human Mutation, 33 (8), pp. 1261-1266.

3. Gioia, R., Panaroni, C., Besio, R., Palladini, G., Merlini, G., Giansanti, V., Scovassi, I.A., Villani, S., Villa, I., Villa, A., Vezzoni, P., Tenni, R., Rossi, A., Marini, J.C., Forlino, A. Impaired

osteoblastogenesis in a murine model of dominant osteogenesis imperfecta: A new target for osteogenesis imperfecta pharmacological therapy. (2012) Stem Cells, 30 (7), pp. 1465-1476.

4. Vissers, L.E.L.M., Lausch, E., Unger, S., Campos-Xavier, A.B., Gilissen, C., Rossi, A., Del Rosario, M., Venselaar, H., Knoll, U., Nampoothiri, S., Nair, M., Spranger, J., Brunner, H.G., Bonafé, L., Veltman, J.A., Zabel, B., Superti-Furga, A. Chondrodysplasia and abnormal joint development associated with mutations in IMPAD1, encoding the Golgi-resident nucleotide phosphatase, gPAPP. (2011) American Journal of Human Genetics, 88 (5), pp. 608-615.

5. Gualeni, B., Facchini, M., De Leonardis, F., Tenni, R., Cetta, G., Viola, M., Passi, A., Superti-Furga, A., Forlino, A., Rossi, A. Defective proteoglycan sulfation of the growth plate zones causes reduced chondrocyte proliferation via an altered Indian hedgehog signalling. (2010) Matrix Biology, 29 (6), pp. 453-460.

6. Bonafé, L., Hästbacka, J., de la Chapelle, A., Campos-Xavier, A.B., Chiesa, C., Forlino, A., Superti-Furga, A., Rossi, A. A novel mutation in the sulfate transporter gene SLC26A2 (DTDST) specific to the Finnish population causes de la Chapelle dysplasia. (2008) Journal of Medical Genetics, 45 (12), pp. 827-831.

Teachings:

1999 - today: “Chemistry and Biochemistry” course, Degree in Sport Science, Faculty of Medicine, University of Pavia.
2002 - 2009: “Biochemistry II and Laboratory of Biochemistry” course, Degree in Biotechnology, University of Pavia.
2007 - today: “Biochemistry” course, Master degree in Medicine and Surgery, Faculty of Medicine and Surgery, University of Pavia.
2009 – today: “Biochemistry”, Master degree in Medicine and Surgery “Harvey” course (thought in English), Faculty of Medicine and Surgery, University of Pavia.
1998 - 2006 optional teaching activity “Methods in Molecular Biology”, Master degree in Medicine and Surgery, Faculty of Medicine, University of Pavia.