Curriculum vitae

Personal Information

Name: **Anna Molnár**

Place and date of birth: Budapest, 4 April 1993

Nationality: Hungarian

E-mail address: molnar.anna.kutdiak@gmail.com

Education

2014- Eötvös Loránd University, Budapest, Biology MSc,
Molecular genetics, Cell and Developmental Biology

2011- 2014 Eötvös Loránd University (ELTE), Budapest, Biology BSc

2007-2011 Mihály Fazekas Primary and Secondary School and Teacher Training Centre, Budapest- Science Faculty

1999-2007 Kandó Square Elementary School, Budapest

Languages

English intermediate (B2)

Research Experience

2011- *Laboratory:* Tumorbiology Laboratory,
1st Department of Pathology and Experimental Cancer Research,
Semmelweis University, Budapest, Hungary

Supervisors: Dr. Anna Sebestyén

Scientific topic: mTOR (mammalian target of rapamycin) activity and mTOR inhibitor sensitivity of colon carcinomas

Examination of microRNA expression levels in colon carcinomas, in tumor cells and in the tumor stroma

Awards

2011 Fazekas Medal
2013, 2014 Eötvös Loránd University Scientific Scholarship
2014 National Board for Talents -'Discoverded Talents of 2014' *Grand Prize*
2014 Eötvös Loránd University 'Excellent Student of the Faculty of Science' Award
2014 Dean's Laudation (Eötvös Loránd University, Faculty of Science)
2014 Stephen W. Kuffler Research Scholarship

Conferences

2010 European Union Contest for Young Scientists (EUCYS), Lisbon
2010 TEDx Youth@Budapest Conference, Budapest
2011 Intel International Science and Engineering Fair (ISEF), Los Angeles

2012 Malignus Lymphoma Conference, Szeged, Hungary
2012 44th Congress of the International Society for Paediatric Oncology, London
2013 Medical, Pharmaceutical and Dental Student Conference of Semmelweis University: *3rd Prize*
2013 18th Frigyes Korányi Scientific Forum, Budapest
2013 European Cancer Congress, Amsterdam
2013 Biology Student Conference of Eötvös Loránd University: *1st Prize* and advanced to the a National Scientific Student Conference in 2015 April
2013 30th Congress of the Hungarian Oncology Association, Pécs, Hungary
2013 Recent advances in molecular and cellular pathology, London (awarded poster)
2014 19th Bolyai Conference, Budapest
2014 Medical, Pharmaceutical and Dental Student Conference of Semmelweis University: 2*nd Prize*
2014 PhD Scientific Days, Budapest
2014 AACR Special Conference on Targeting the PI3K-mTOR network in cancer, Philadelphia
2014 43rd Meeting of Hungarian Immunology Association, Velence, Hungary

Publication in peer-reviewed original research paper

Anna Molnár: Diószegi Sámuel Emlékfa. Természet Világa 140/5, 2009.

Anna Sebestyén, Ágnes Márk, Melinda Hajdu, Noémi Nagy, Anna Molnár, Gyula Végső, Gábor Barna, László Kopper: Rapamycin can restore the negative regulatory function of transforming growth factor beta 1 in high grade lymphomas. *submitted*

Research objectives

At age of 18 I joined the Tumorbiology Laboratory lead by Dr. Anna Sebestyén at the 1st Department of Pathology and Experimental Cancer Research, Semmelweis University.

We are focused on the mTOR (mammalian target of rapamycin) kinase activity which is a central controller of a wide range of cell functions, like cell cycle, protein synthesis, metabolism and proliferation. mTOR kinase plays a crucial role in tumor growth and cancer development. mTOR set up two different protein complexes (mTORC1 and C2 complex). Enhanced activity of mTOR is frequently observed in many cancer types, therefore inhibition of mTOR has become a potential therapeutic strategy. mTOR inhibitors are in clinical use in therapy of some cancer types but in several cases resistance to them occur. We examined the molecular basis of resistance to mTOR inhibitors in colon carcinomas.
We found that high activity of mTORC2 complex may cause resistance to specified mTOR inhibitors and *in situ* quantitative determination of active mTORC1 and C2 complexes could be used as diagnostic method to define the appropriate therapy for each patient.
We identified that combination therapy of mTOR and EGFR (epidermal growth factor receptor) inhibitors in colon carcinoma cell lines increases the inhibition of proliferation compared to using them alone. These results confirm the necessary of combination therapy in cancer treatment and it may decrease the resistance related issues to mTOR inhibitors.

Now and in the near future we examine specified microRNA expression levels in colon carcinomas. since miRNA could influence the tumor growth and development. mTOR-related miRNAs have been also discovered and we are interested in identification of them in colon carcinomas using Real-Time PCR technique. We use formalin-fixed, paraffin-embedded (FFPE) colon carcinoma samples and lasermicrodissected colon carcinoma tumorous epithelial and tumor stroma cells in comparison to normal epithelial cells and normal stroma. After isolation of RNA and preamplification we examine and compare the expression level of selected miRNAs.

We hope our results will contribute to understand the exact role of the microenvironment and miRNAs in tumor progression to control and modify the expression of miRNAs to inhibit cancer growth.