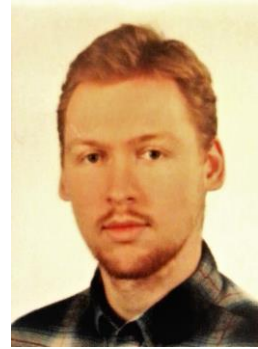


## MIKOŁAJ ZIMNY

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### EDUCATION

**Medical University of Silesia in Katowice**, Faculty of Medicine 2013 – present  
**Juliusz Słowacki High School in Chorzów** 2010 – 2013

### HONORS & AWARDS

Stephen W. Kuffler Research Scholarship 2018, Budapest 2018  
2<sup>nd</sup> Prize for the Oral Presentation Award at the 26th International Medical Students Conference, Cracow 2018  
1<sup>st</sup> Prize for the Oral Presentation Award at the XIII International Pirogov Scientific Medical Conference of Students and Young Scientists, Moscow 2018  
3<sup>rd</sup> Prize for the Oral Presentation Award at the Polish Scientific Conference Neurotrip 4 - Intracranial Tumors, Warsaw 2018  
Chancellor's Scholarship for the Best Students, Katowice 2017  
1<sup>st</sup> Prize for the Oral Presentation Award at the International Medical Congress of Silesia 2017, Katowice 2017

### RESEARCH & WORK EXPERIENCE

**Clinical, hemodynamic and morphometric risk factors for aneurysm on MCA**, the Provincial Specialist Hospital no. 5 in Sosnowiec 2018 – present

**The role of neuroimaging in children and adolescents with headaches**, the Independent Public Clinical Hospital no. 6 of the Medical University of Silesia in Katowice 2016 – present

**Clinical, hemodynamic and morphometric risk factors for aneurysm on ACoA**, the Provincial Specialist Hospital no. 5 in Sosnowiec 2016 – 2018

**Meningiomas in children**, the Independent Public Clinical Hospital no. 6 of the Medical University of Silesia in Katowice 2017

## **PUBLICATIONS & PRESENTATIONS**

Marta Sobkowiak, Wojciech Wolański, Edyta Kawlewska, Marek Gzik, Kamil Jozsko, Mikołaj Zimny, Wojciech Kaspera. 2018. Simulation of blood flow in arteries for different flow rates. *Modelownie Inżynierskie* – in publication

Marek Mandra, Mikołaj Zimny, Anna Karolina Malec, Daniel Bula, Michał Bałuszyński. 2017. Cavernous malformation of left basal ganglia region in a 12-year-old boy – case report. *Oruen – The CNS Journal*, 3 (1), p. 48-51.

Ilona Kopyta, Mikołaj Zimny. 2015. Significant risk factors in the etiology of arterial ischemic stroke in children. *Oruen – The CNS Journal*, 1 (1), p. 6-10.

Ilona Kopyta, Beata Sarecka-Hujar, Mikołaj Zimny. 2015. Arterial ischemic stroke in children – current views on etiopathogenesis and treatment. *Standardy Medyczne Pediatria*, 12 (4), p. 594-601.

Ilona Kopyta, Mikołaj Zimny, Beata Sarecka-Hujar. 2015. The role of biochemical risk factors in the etiology of AIS in children and adults. *International Journal of Neurosciences*, 125 (12), p. 875-884.

Mikołaj Zimny. Computational Fluid Dynamic Simulation of Middle Cerebral Artery Bifurcation Based on Computed Tomography Angiography and Doppler Sonography Image Data. XIII International Pirogov Scientific Medical Conference of Students and Young Scientists, Moscow, 2018

Mikołaj Zimny. Computational fluid dynamic simulation of middle cerebral artery bifurcation based on computed tomography angiography and Doppler sonography image data. 13<sup>th</sup> Warsaw International Medical Congress for Young Scientists, Warsaw, 2017

Mikołaj Zimny. Computational fluid dynamic simulation of middle cerebral artery bifurcation based on computed tomography angiography and Doppler sonography image data. 25<sup>th</sup> International Medical Students Conference, Cracow, 2017

Mikołaj Zimny. Computational fluid dynamic simulation of middle cerebral artery bifurcation based on computed tomography angiography and Doppler sonography image data. 12<sup>th</sup> Białystok International Medical Congress for Young Scientists, Białystok, 2017

Mikołaj Zimny, Artur Borkowski, Piotr Heba, Mariusz Kucharczyk, Małgorzata Bastrzyk, Paweł Jarski. Effectiveness of invasive treatment in patients with ruptured intracranial aneurysms. 11<sup>th</sup> Białystok International Medical Congress, Białystok, 2016

Mikołaj Zimny, Paweł Jarski, Artur Borkowski, Piotr Heba, Mariusz Kucharczyk, Małgorzata Bastrzyk. Ruptured intracranial aneurysms – presentation of anatomic morphology, clinical results and early complications in patients treated with endovascular coiling and neurosurgical clipping. 24<sup>th</sup> International Medical Students' Conference, Cracow, 2016

## **RESEARCH INTEREST**

Intracranial aneurysms (IAs) are acquired vascular abnormalities that develop in 2-5% of the population. Most aneurysms are small and carry a 0.7% annual risk of subarachnoid hemorrhage (SAH). The incidence of SAH is estimated at 10-15/100.000 annually. Despite the progress in the endovascular and microsurgical treatment, consequences of SAH are often catastrophic. Mortality of patients hospitalized due to SAH reaches up to 40%. According to current knowledge, the hemodynamic factors play a key role in aneurysm formation.

Based on the experience gained so far in the field of blood flow analysis using computer simulations I would like to extend my research by including a group of patients with intracranial aneurysm located on the middle cerebral artery (MCA). MCA, same as anterior communicating artery, is highly predisposed to develop aneurysms near its bifurcation. The innovative element I would like to introduce will be the use of fluid-structure interactions (FSI) techniques during the simulations, which would allow me to explicitly model conditions and forces acting on the arterial walls during the cardiac cycle. Therefore, during my research I will hypothesize the influence of hemodynamic and morphometric factors on the formation and rupture of brain aneurysms located on the division of the MCA.

I am honored to receive this research scholarship awarded by the Stephen W. Kuffler Research Foundation which will enable me to pursue my desire of discovering new risk factors for intracranial aneurysms. Moreover, I do believe that our findings will provide a revealing insight into the prevention of cerebrovascular diseases and life-threatening conditions like subarachnoid hemorrhage.