N.	Faculty	Topic	Descritption	Topic Coordinator
1	**Faculty of International and Political Studies**	Migration and integration policies of the European countries - new challenges, new opportunities.	In the face of intense migratory movements caused by many factors of diverse nature (economic, political, religious, cultural, social), societies of the united Europe, have to prepare to meet and confront the newcomers/migrants. These confrontations, or rather - encounters, require a proper organization of socio-economic and political order of individual countries. An effective management of the relations 'autochthons – newcomers' can be, and should be, obtained by an integration policy designed for particular countries respecting their particular cultural, political, economic etc conditions. A long year experience of some multicultural European societies such as the French, German, British, Spanish, Portuguese or Swedish provides a rich material for a comparative study that should serve a common European goal – to make the integration more effective and successful. A comparison of the integration policies present in Europe, selection of the most effective solutions for harmonious cooperation of the host society and migrants becomes the matter of the highest priority for the future generations and the future of European countries.	Prof. Dariusz Juruś, dariusz.jurus@uj.edu.pl Prof. Monika Banaś, monika.banas@uj.edu.pl
2		The adaptation process of students from Asia and Africa in the selected European countries. Stereotypes and prejudices.	The project includes research regarding processes of acculturation and adaptation of students from Asia, the Middle East and Africa, receiving education at European universities. The main objective of the project is to create a database which would facilitate future informational and educational activities, enabling intercultural dialogue between students from Asian, Middle Eastern and African countries and the European communities To achieve this goal, a comprehensive qualitative research will be carried out, which will allow us to examine and describe adaptation difficulties faced by the students coming from Asian, Middle Eastern and African countries, as well as acceptance barriers experienced by the European communities toward the students from the above mentioned regions of the world. The proposed research will also take into account regional variables, such as: political history of host and home countries, social and religious structure of host and home countries, economic situation of host and home countries, regional cultural conditions of home countries.	Prof. Renata Czekalska, r.czekalska@uj.edu.pl
3		Security and cultural rights in the era of globalization processes.	Increasing mobility and diversity and, as a consequence, the interaction of cultures in the era of globalization processes poses a question about the principles governing their relationships. Both conflicts and the cooperation of contemporary communities and organizations puts in the field of interest today's science, politics and management the problem of their rights and the principles that determine their security. The way of understanding these rights and security remains an open question. The roots of understanding these categories go back at least to the fifteenth century of the European history of ideas, law and social thought. In the period of growing processes of multiculturalism, and conflicts of fundamental values of individual cultures and communities, these ideas are subject to both revitalization and transformation. Working out common rules for their understanding may form the basis for a new order of the intercultural and international community in selected regions of the world. A sustainable model of cultural security is a proposal and inspiration for a joint research and educational project of academic centers with culture-creating functions that undertake challenges and cooperation with institutions of the social environment.	Prof.. Leszek Korporowicz, leszek.korporowicz@uj.edu.pl
4		New Challenges in Transatlantic Relations : Retiring Democracy?	North American and Europe alike are facing the challenges to democratic system. Growth of populism accompanied by equal growth of xenophobia represent serious threat to political stability on both sides of the Atlantic. However, this is not only the threat to each individual state, resulting distrust is undermining traditional Transatlantic relations and challenging the North Atlantic community (reaching far beyond military pact). The intended collaborative project should focus on these challenges and investigate the evolution on the discourse on Transatlantic relations, tracing the evolving understanding of such values as liberty, civil rights, equality and social cohesion. Without common understanding of the key principles of political and social system the Transatlantic could not survive and will not be able to collaborate on solving the problems of 21st century, including climate change, refugee crises and unprecedented economic equalities. North America and Europe represent different understanding of the importance of these challenges and this difference leads to proposing competing visions how to cope with the emerging problems. In the globalized world, however, it is no longer possible to be successful "bowling alone". This is the reason why identification of the difference between North America and Europe is necessary starting point without which there would be no possible to rebuild the mutual trust within Transatlantic community. This also the explanation why collaborative project is necessary for detailed investigation: without it the adopted perspective would be too narrow and could not answer the title question about the condition of democracy.	Prof.. Radosław Rybkowski, radoslaw.rybkowski@uj.edu.pl

5	**Faculty of Management and Social Communication**	Lean Higher Education – Lean Culture in Higher Education	The research is aimed at showing how production concepts, e.g. Lean Management, implemented in educational and public institutions change their definitions, meanings as well as the ways in which they are understood and introduced. The research also deepens the understanding changes of organisational culture in a university influenced by Lean Management concept. Also, the purpose of the research is further development the Lean Culture Maturity Model and Lean Culture Maturity Questionnaire which were created by the author to assess Lean Culture in a university. The result of previous research was published in the book Lean Culture in Higher Education. Towards Continuous Improvement.	Justyna Maciąg,PhD, , justyna.maciag@uj.edu.pl
6		Communication in the field of politics as a key to enhancing media pluralism and social coherence in the EU.	The aim of the project is to research based toolbox that can be presented to and implemented in the field of political communication in order to enhance media pluralism and social coherence in the EU countries. The toolbox will be a mix of communication strategies (direct-communication, online communication etc.) based on research results addressing citizents and journalists/media experts eager to influence the sphere of politics in order to focus attention and change the negative trends in both spheres.	Prof. Dominika Kasprowicz, dominika.kasprowicz@uj.edu.pl
7		Media trust, accountability and transparency.	The proposed project addresses the importance of analyzing trust and accountability in the news media as well as the role of media transparency in shaping citizens' media exposure in selected European countries. It considers the implications of this analysis for our understanding of the ongoing risks to the democratic functions of the media, pluralism and news consumption. The proposal explores how democratization of information and the news media can strengthen political discourse and decision-making. An understanding of the current crisis of citizens' trust in authorities cannot be studied without analyzing the role of the media accountability in this process. The growth of social media and powerful news intermediaries necessitate further consideration of the shift in influence from established media outlets to platform institutions. Equally important is to understand the potential role played by the state in the digital domain to guarantee media freedom, independence and pluralism. Key objectives of the proposed research are to explain, conceptually and empirically, the relationship between trust and accountability in the news and media transparency and to clarify the potential role of trust, accountability and transparency in supporting the democratic functions of the media. The proposed project also seeks to compare "good practices" and develop policy recommendations.	Prof. Beata Klimkiewicz, beata.klimkiewicz@uj.edu.pl
8		Industrial Transformation in Europe - Towards Industry 4.0	If we assume that robotisation based on digitalisation and advanced automation in industry is an essential condition of the transfer to the stage defined by Industry 4.0 confinements, there are considerable barriers in Central and Eastern Europe to proceed to the next stage in the organization of the production processes: 1. The profile and a relatively small production scale. From the Polish perspective it signifies that the specificity of produced items or the organizaton of the production process do not need any instalation of the automatic means of production processes. 2. No need of robotisation means that current organization and the degree of the technological advancement in the productive process in Polish companies are perceived as adequate from the present point of view of the company's situation. In some cases that means that the entrepreneurs do not see any necessity of automation in general. 3. Low salary rate, hence prolonged periods of amortisation of the automation means in the production process. 4. Shortage of specilised staff; particularly in the sphere of mechatronics i.e. robotics, automatics, sensorics, actuatorics, electronics and IT. 5. Lack of company owned and produced mechatronic components that are made in-country, which is not a necessary condition in the ultimate mechatronisation of the equipment, however, it would suit the technical and organizational progress of Polish industry 3.0 stage advancement, i.e. robotisation based on digitalisation and advanced automation of 2.0 stage, appear insufficient in the present situation of Polish industry in order to discuss with full responsibility the possible transfer to the stage as defined by Industry 4.0 assumptions. We propose the following dimensions of industry 4.0 analysis: - technological, economical, institutional aspects, - the challenges for workers and for education (including gender aspects), - the challenges for technology assessment (science, society), - smart specialisation and European regions.	Prof. Ewa Okoń-Horodyńska, ewa.okon-horodynska@uj.edu.pl
9		Development Strategy for Future University	Development and change ensures that we are delivering the best possible experience to our stakeholders and providing an academic environment that facilitates world-changing research. Strategies at different levels in universities are not taken in consideration, and strategies are not determined by high participation and not formed and implemented in a conscious way. So, how participation of academic and administrative personnel is provided, in which way it is focused on creating value for all stakeholders, how internal and external environment analysis are made with which scientific research projects and how corporate learning is supported in every stage of the process. What should be the plan in strategy for future management in university and the four main fields: research, teaching, learning and grow?	Prof. Justyna M. Bugaj, j.bugaj@uj.edu.pl

10		Framework topic: Leisure industries. Determinants of development. Contemporary trends	The proposed scope of research for discussion: Analysis of the structure of modern forms of economic activity constituting leisure industries (in particular: tourism, sport, recreation, culture, entertainment). Assessment of differences in the level of consumption in the scope of leisure offers in European Union countries, taking into account market segmentation criteria (diversity in individual generations from baby-boommers to generations Z and alpha). Diversity of leisure consumption between EU countries with a higher and lower level of quality of life. Analysis of new trends regarding purchasing patterns related to the consumption of offers in terms of leisure, under the influence of factors such as: shared consumption, new information technologies including: social media, mobile technologies. Assessment of the impact of crisis phenomena in the global and European economy on the manner of consumption in the scope of leisure offers: climate change, international situation (including terrorism) as factors determining tourism mobility. Overtourism as a factor limiting tourism trips to selected cities and tourist destinations, analysis of consequences for the tourist market. Demographic changes including life extension as factors stimulating consumption in the scope of leisure offers. Substitution between particular types of leisure industry (e.g. sport and e-sport, participation in public culture and culture in the virtual world). The role of artificial intelligence in changes in the labor market and reduction of employment, and thus a massive extension of the possibility of using leisure (absolute basic income as an instrument to finance demand). Development of the concept of standards related to the leisure time budget, determinants and trends in demand and supply in the period up to 2030 and approximate forecasts up to and after 2050.	Prof. Aleksander Panasiuk, aleksander.panasiuk@uj.edu.pl
11		Framework topic: Leisure industries. Determinants of development. Contemporary trends.	The proposed scope of research for discussion: Analysis of the structure of modern forms of economic activity constituting leisure industries (in particular: tourism, sport, recreation, culture, entertainment). Assessment of differences in the level of consumption in the scope of leisure offers in European Union countries, taking into account market segmentation criteria (diversity in individual generations from baby-boommers to generations Z and alpha). Diversity of leisure consumption between EU countries with a higher and lower level of quality of life. Analysis of new trends regarding purchasing patterns related to the consumption of offers in terms of leisure, under the influence of factors such as: shared consumption, new information technologies including: social media, mobile technologies. Assessment of the impact of crisis phenomena in the global and European economy on the manner of consumption in the scope of leisure offers: climate change, international situation (including terrorism) as factors determining tourism mobility. Overtourism as a factor limiting tourism trips to selected cities and tourist destinations, analysis of consequences for the tourist market. Demographic changes including life extension as factors stimulating consumption in the scope of leisure offers. Substitution between particular types of leisure industry (e.g. sport and e-sport, participation in public culture and culture in the virtual world). The role of artificial intelligence in changes in the labor market and reduction of employment, and thus a massive extension of the possibility of using leisure (absolute basic income as an instrument to finance demand). Development of the concept of standards related to the leisure time budget, determinants and trends in demand and supply in the period up to 2030 and approximate forecasts up to and after 2050	prof. dr hab. Aleksander Panasiuk, Instytut Przedsiębiorczości, aleksander.panasiuk@uj.edu.pl

12	**Faculty of Chemistry**	Selective methods of controlled spatiotemporal delivery of novel homo- and heterometallic Ru, Ir and Cu complexes for effective cancer treatment	The main objectives of this project are design, synthesis, and characterization of novel (i) Cu(I), Ru(II), and Ir(III) mononuclear complexes, and (ii) Cu(I)/M, Ru(II)/M, and Ir(III)/M (M = Cu(II), Co(II), Mn(II)) heteronuclear complexes with phosphines derived from biologically active amines, amino acids and peptides that enable selective delivery of these compounds to cancer cells. In-depth studies on selective transport of chemotherapeutics revealed that the specific properties of tumor cells, such as overexpression of a variety of proteins and receptors, facilitate interactions with cancer cells and effective uptake. Thus, our first approach is to connect peptide carriers to ruthenium, iridium and copper complexes via phosphines ligands to enable selective and efficient delivery of our complexes into cancer cells. The second method is to encapsulate metal complexes into micelles and liposomes in order to increase their accumulation inside tumor cells. Finally, third tactic is to enrich proposed simple drug delivery systems (micelles, liposomes) with ferromagnetic substances to control spatiotemporal delivery of the loaded complexes to the tumor by magnetic field. Particular research goals will include (a) development of effective and efficient method for the synthesis of phosphine derived from biologically active amines, amino acids and peptide and complex-phosphine systems, (b) determination of the physicochemical properties and solution behavior properties of the synthesized conjugates and the resulting metal complexes, (c) study on the reactivity of complex-peptide systems with potential cellular targets and different biomolecules (DNA, albumin, lipid membranes, membrane receptors and transporters), (d) evaluation of biological activity in vitro against several human tumor and nan-cancerous cell lines (either 2D and 3D cell culture systems), (e) explanation of the mechanism of cancer cell death induced by tested compounds, (f) development of simple drug delivery systems (micelles, liposomes) and encapsulation of metal complexes, (g) development of selective methods of controlled spatiotemporal delivery of novel homo- and heterometallic Ru, Ir and Cu complexes, (h) preliminary efficacy, toxicity and biodistribution in vivo studies in syngeneic murine models.	Prof. Agnieszka Kyzioł, kyziol@chemia.uj.edu.pl
13		Prevention of biofilm-forming antibiotic-resistant bacterial infections	Currently, the World Health Organization has recognized drug resistant bacteria, which is now classified not only as multidrug resistant (MDR), but also as an extensively drug-resistant (XDR), as one of the greatest health threats of the beginning of the 21st century. This project will be focused on the reduction of bacterial biofilm formation and the associated increase of antibiotic resistance. In this context, we propose to tackle skin and soft tissue infections including chronic wounds caused by methicillin-resistant strains of Staphylococcus aureus (MRSA) and antibiotic-resistant Pseudomonas aeruginosa using materials such as (i) controlled delivery systems, (ii) electrospun wound dressings, and (iii) bioactive surface coatings dedicated for functionalization of medical devices. Proposed materials will contain different antimicrobial agents such as (i) compounds of natural origin, (ii) metal nanoparticles (e.g., Au NPs) prepared by methods based on Sustainable Chemistry, and (iii) iminosugars. The latter compounds will be proposed and tested as efficient inhibitors of quorum sensing and biofilm formation. Thus, the project involves preparation of hybrid materials and coatings characterized by a spatiotemporal control of bioactive agents release and dedicated to both conscious prevention (mode of action based on iminosugars) and effective treatment of the infected wounds (antimicrobial action based on agents of natural origin and metal NPs). Natural origin have shown antimicrobial properties minimizing the development of resistances and susceptibilities due to their multiple mechanisms of action, in contrast to antibiotics that usually have a single target site. When multiple mechanisms of action take place against a pathogenic microorganism, simultaneous gene mutations are difficult to occur and consequently the development of resistances is less likely. The designed and prepared materials will be made of among others polymers such as polycaprolactone (PCL), chitosan, and PCL/PVAc (polyvynil acetate). While antimicrobials of natural origin will include Au NPs obtained with application of plant extracts and particular bioactive compounds as caffeic acid, cinnamaldehyde, carvacrol and thymol. All materials will be precisely characterized and tested in vitro and in vivo to select the most active materials to eradicate biofilm-forming bacterial infections with no cytotoxicity against eukaryotic cells.	Prof. Agnieszka Kyzioł, kyziol@chemia.uj.edu.pl
14	**Malopolska Centre of Biotechnology**	Assembling artificial protein cages	Based on our recently accepted Nature paper reporting a novel protein cage, we propose using cutting edge techniques to understand how this system self-assembled molecule by molecule and develop new chemistries to join together component proteins enabling a wide variety of new artificial cages with tuneable characteristics	Jonathan Heddle, PhD, Hab. Malopolska Centre of Biotechnology. jonathan.heddle@uj.edu.pl

15	**Faculty of Philology**	Use of sytometry, a computer-based method of textual analysis which makes it possible to determine the authorship of a text	The topic for grant research I suggest concerns the use of sytometry, a computer-based method of textual analysis which makes it possible to determine the authorship of a text. By counting the frequencies of words and their interdependence, the stylometric software allows to find the – so-called – authorial fingerprint, that is, the individual element of a given author's writing style. The stylometric research also allows to compare and contrast large corpora of texts to conduct a quantitative studies that would not be possible with the use of traditional research methods – thus, determining their chronology and stylistic evolution. So far, the stylometric research has been frutifully applied for grant research three times: twice for OPUS grants of the Polish Ministry of Higher Education (with dr Jan Rybicki and dr Agata Hołobut as the lead researchers) and once for an international seed-funding grant between the Institute of English Studies at the Jagiellonian University and the DH lab at the University of Postdam.	Jan Rybicki, PhD, jan.rybicki@uj.edu.pl
16		Epistemological positioning in specialised discourse	My research project aims to analyse epistemological strategies pursued by participants in specialist discourses, with special focus on legal communication (including courtroom examinations and judgments). The research will provide more insight into the ways in which participants in specialist discourses communicate and negotiate their belief, knowledge and unknowledge as well as shed more light on how evaluation is expressed in institutional contexts. As part of the research, I intend to analyse verb patterns and examine their pragmatic role (focusing in particular on verba dicendi, verba mentalis and verba sentiendi). The research is conceived as a Corpus-Assisted Discourse Study. I would be interested in extending the scope of my research by incorporating one of the following elements (to be carried out in cooperation with a researcher from a partner university): - analysis of verb patterns in other English-language legal genres or in other English-language specialist discourses (e.g. in medical, political or academic discourse); - analysis of similar epistemic and evidential phenomena in legal genres formulated in languages other than English; - analysis of other stance-related and evaluative phenomena in English-language legal genres (including, but not limited to, courtroom examinations and judgments).	Magdalena Szczyrbak, Phd., magdalena.szczyrbak@uj.edu.pl
17		Byzantine contexts of the Cyrillic literature between the Black Sea and the Baltic Sea	The aim of the research project will be to present the Old Church Slavonic (Cyrillic) literary heritage from the territories belonging to the former Polish-Lithuanian state (later the Polish-Lithuanian) and historically dependent from this state, which once occupied large areas between the Black Sea and the Baltic Sea. In this multiethnic and multidenominational state, in the period from the 15th to the end of the 17th century, a specific model of the Eastern Christian culture developed, which in a way different from that of the Moscow State, benefited from the achievements of the Byzantine and South Slavic (Balkan) literary traditions. The subject of the research will be mainly medieval Cyrillic and Greek manuscripts, provenance connected with the area of the former Polish-Lithuanian state, which will be assessed in terms of their typicality and their place in the literary and ritual system of the Orthodox culture. The research will help in more precise description of the cultural specificity of the eastern lands of the former Commonwealth, providing arguments in the form of the indication of the source material (texts, codes) associated with the Byzantine and Balkan literary culture and showing the real impact of this culture on the Orthodox subsystem of the multidenominational (though formally Roman Catholic) culture of the Commonwealth. All scientific institutions indicated in the application specialize in the research of Slavic and Greek manuscripts and have a qualified group of scientists. The project will be interdisciplinary and will be implemented mainly by philologists, historians and theologians.	Prof. Jan Stradomski jan.stradomski@uj.edu.pl

18		Cultural and Literary Polish-Croatian Relations	Cooperation between the Institute of Slavic Philology and the Department of Polish Studies at the University of Zagreb has a long tradition,. We share common research topics, participation participate in conferences organized by both centers, cooperation between researchers and translators. That is why we would like to undertake joint research on Polish-Croatian relations over the centuries. Poland and Croatia combine share many similarities, such as adherence to Latin civilization and similar historical experiences. Many archival materials regarding mutual relations that can be found in Krakow and Zagreb remain not examined. Croats are more connected with Krakow than with any other place in Poland. Outstanding representatives of Croatian Humanism and the Renaissance (including V. Pribojević, A. Vrančić) studied at the Jagiellonian University in the fifteenth and sixteenth centuries. Krakow was the capital of the Kingdom of Croatia during the reign of Władysław Warneńczyk. The epos of the most prominent writer of the Croatian Baroque, Ivan Gundulic, "Osman", praised the Polish weapons from the Chocim battle, which was fought by Władysław IV Waza, born in Krakow. At the end of the 19th century, when Zagreb was destroyed by the earthquake, the Cracovians prepared the album "From Krakow to Zagreb", and the money from its sale was donated to the reconstruction of the devastated city. Just before the First World War, Ivo Andrić, a Nobel laureate in the field of literature (in 1961), studied in Krakow.	Prof. Magdalena Dyras magdalena.dyras@uj.edu.pl
19		Avant-garde Art: Ukrainian Artists of the First Third of the 20th C.		Dr Hab.. Agnieszka Kornijenko agnieszka.korniejenko@uj.edu.pl, korniejenko@gmail.com
20		Towards Xenoethics. Literature and Hospitality	Towards Xenoethics. Literature and Hospitality The aim of the project is to analyze selected Polish and German-language literary texts dealing with the issue of hospitality in the context of the problem of migration, strangeness, and translation. Currently, there is no shortage of interesting theoretical concepts of hospitality (e.g. works by Paul Ricoeur, Jacques Derrida). There is also interesting analytical material, i.e. German-language and Polish literature asking questions about the relationship between the host and a stranger from another culture (see e.g. novels by Sherko Fatah and Bronisław Świderski). However, there seems to be a lack of an intercultural project aimed at describing this diverse literature in the context of the European migration policy, as well as the idea of "xenoethics", which could become a common value of the European culture. Exemplary literature: Davidson, S. Linguistic Hospitality: The Task of Translation in Ricoeur and Levinas. Analecta Hermeneutica, n. 4, may 2013. de Bończa Bukowski, P. Der Fremde im Königreich der Dänen. Das Wort, der Diskurs und die Fremdheit in Bronisław Świderskis Roman Słowa obcego. Folia Scandinavica Posnaniensia, Vol. 24, 2018. Dufourmantelle, A., Derrida, J. Of Hospitality. Translated by R. Bowlby. Stanford: Stanford University Press 2000.	Prof. Piotr de Bończa Bukowski, piotr.bukowski@uj.edu.pl

21	**Faculty of Health Science**	Creating „Dementia friendly hospitals"	Dementia is a syndrome, usually of a chronic or progressive nature, caused by a variety of brain illnesses that affect memory, thinking, behavior and ability to perform everyday activities. According to the World Health Organisation, the number of people living with dementia worldwide is currently estimated at 47 million and is projected to increase to 75 million by 2030. The number of cases of dementia is estimated to almost triple by 2050. Dementia is overwhelming not only for the people who have it but also for their caregivers and families. There is a lack of awareness and understanding of dementia in most countries, resulting in stigmatization, barriers to diagnosis and care, and impacting carers, families, and societies physically, psychologically and economically. One of the most devastating problems faced by caregivers and patients in dealing with aggressive behavior. Aggression occurs in half of the persons diagnosed with dementia and is associated with more rapid cognitive decline, increased risk of abuse, and caregiver burden. According to Alzheimer's Society, 25% of hospitals beds are occupied by people living with dementia who are over 65. However, most of the hospitals seem to be not prepared for dealing with a patient with dementia. 90% percent of family members said they felt the person with dementia became more confused while in hospital 92% percent thought hospital environments were frightening for the person with dementia. The goal of the project would be creating the „dementia friendly hospitals". It would be provided by: - assessment of the scale of the phenomenon (measuring the incidents, it's reason's, personnel reactions) - identification of the main causes of difficult behaviors (internal/ external stimuli, environmental impact) - ideas of solutions, the creation of "dementia friendly hospitals:", based on training of staff and carers, prevention of occupational burnout, - assessment of the effectiveness of different types of interventions such as reminiscence therapy, therapeutic dolls or multi-sensory rooms. Only a holistic approach to the challenging behavior in dementia focused on both patients and staff will give the chance to make hospitals "dementia friendly places"	Jakub Lickiewicz,PhD, jakub.lickiewicz@uj.edu.pl
22	**Faculty of Polish Studies**	Traditional oral children's folklore of of the Polish-Slovak borderlands (Spiš, Šariš, Krosno region, Sanok region). Aspects: ethnolinguistic, ethnomusicologic and textological.	A survey of children's verbal folklore in the regions mentioned above reveals a surprising richness and similarity of forms. This may testify to the deep, historical affinity of the traditional oral culture of both nations. The hypothesis may be verified by comparative studies of such selected species of children's rural oral folklore as: lullabies; counting-out rhymes; charms and invocations; nursery rhymes; rhymes used during whittling of pipes, etc. The project envisages the publication of two volumes of scientific work, including I. Children's folklore; II. Folklore for children. The project aims to use the research to promote regional culture and education (children and parents).	Prof. Kazimierz Sikora, e-mail: k.sikora@uj.edu.pl
23	**Faculty of Physics, Astronomy and Applied Computer Science**	Small van der Waals complexes investigated spectroscopically in supersonic beams – interatomic potentials from experiment versus results of ab initio calculations.	A critical studies of experimental and ab initio calculated interatomic potentials of the lower-lying Rydberg and ground states of van der Waals dimers are going to be undertaken. Consistency as well as discrepancies between experimental results and ab initio calculations will be probed. In order to obtain better agreement with existing experimental data, fill in gaps in current knowledge and provide a unifying framework, advanced all-electron ab initio calculations are going to be performed and simulations of the reported and recorded spectra will be executed. From simulations of laser-induced fluorescence excitation and dispersed emission spectra, analytical and/or point-wise representations of the Rydberg and ground-state interatomic potentials will be obtained. The comparison of the ab-initio calculated potentials with results of the analyses will permit to illustrate a current state-of-the-art of theory-and-experiment correspondence for such a demanding systems. Results will be presented in the context of an importance of the group 2 and group 12 metal dimer interatomic potentials especially, in ultra-cold physics and chemistry, and in fundamental tests of quantum mechanics.	Prof. Jarosław Koperski e-mail: jaroslaw.koperski@uj.edu.pl
24		Introducing emotion awareness and explainability into intelligent assistive technology	Today society needs humanized technology that is able to understand the users and their needs. Current technology is often logical, assertive, but perceived as cold, thus socially ignorant, alienating people who do not trust it. Computer systems allowing for interpretation and use of information on emotional conditions of humans will be the key to more human-like intelligent systems. This needs combination of several research paradigm including artificial intelligence, and affective computing. The central challenge of the project is to lay both conceptual and practical foundations for the design development of affective companions, i.e. computer systems that are emotionally-aware and socially intelligent. The project will pave the way for these systems to be understandable, transparent, and safe, thus having positive economical and societal impact. The development of affective companions takes place beyond a single research domain, and it requires broad multidisciplinary cooperation. Furthermore, we wish to explore societal and legal aspects of the development of this technology. Finally, we will be considering its application in several domains including ambient intelligence, medicine, and law.	Prof. Grzegorz J. Nalepa, grzegorz.j.nalepa@uj.edu.pl

25	**Faculty of History**	Secondhadness Revisited: Continuity and Change in European Waste-Disposal Cultures	The subjects of material values and waste are increasingly discussed in sustainable design, environmental studies, industrial ecology, and cultural theory. The issue of re-use of industrial and food products is one of the elements that continue to diversify European society as a whole. In particular, in a situation where not so much politics or regulations, as daily life cultures, deeply rooted traditions, and even religion are proving to be of great importance for disposal management. The purpose of the joint multidisciplinary research project would be the analytical map of European waste management cultures in the geographical and temporal cross-section with a focus on the idea of "secondhandness". The traditions of reuse varied throughout time and space, developed or terminated under differentiated political regimes. The prospective research and education project, in which science centers, as well as museum and educational institutions, would be involved, has the potential to indicate these areas of "sencondhandness" traditions – the European and the recently imported by non-European emigrants - which can be a fruitful legacy for the future of our natural environment.	Prof.. Marta Kurkowska-Budzan, marta.kurkowska-budzan@uj.edu.pl
26		Physical labor - the suppressed European heritage	Physical work, although it is an integral part of human history, is hardly visible in the institutions that allegedly tell about it. For example, the open-air museums present clean tools that farmers used in their daily, hard and dirty work. Tools are there the artifacts that say nothing about the bodily experience that they were part of. On the other hand, the same or very similar bodily experience is subject to a kind of gentrification in fitness clubs inventing similarly fatigued and heavy training programs for their customers. The aim of the interdisciplinary research project is to examine the past and contemporary discourses on physical labor, the results of technological and economic changes for that discourse, and to identify gaps and misses that have arisen in narratives about physical work in the end of 20th century and are a source of inequalities, exclusions, and misunderstandings in contemporary European societies between generations, communities, ethnic groups. The project will have educational facets and should intervene in museal narratives about physical work as the European heritage.	Prof. Marta Kurkowska-Budzan, marta.kurkowska-budzan@uj.edu.pl
27	**Faculty of Philosophy**	The rise of the anti-vaccination movement: discourse and strategies. A comparative analysis.	To vaccinate or not to vaccinate? This has become a major problem of many parents. Hesitant, lacking scientific knowledge and concern from medical professionals, they desperately search for answers to their questions. These are the silent, invisible masses that the anti-vaccination movement tries get through to. This comparative project will aim to shed a light on anti-vaccination movements in a number of European countries. These movements will be shown through the lens of their discursive strategies, including public visibility of the discourse, types of knowledge that they produce, various resources they use and the way they validate themselves, or in other words, try to be legitimized in healthcare, in the public debate, by the public. The World Health Organization has called vaccine hesitancy one of ten threats to global health in 2019. The problems of vaccine refusal and hesitancy have in the recent years become major concerns for policy-makers, and for the public health. Therefore, many European countries undertake various institutional solutions and legal regulations to ensure vaccination rates' rebound. The project will also aim to assess the results of these regulations, considering not only their efficiency, but also how they are perceived by the public, including the hesitant masses. The project will use discourse analysis as the basic tool for comparative reconstruction of anti-vaccination movements' strategies. Media and internet discourse, including internet forums and social media, will be analyzed. Additionally, workshops and narrative interviews with actors involved in the vaccination discourse will be carried out.	Paulina Polak, PhD, Instytut Socjologii, paulina.polak@uj.edu.pl
28		**Escape from misery Utilizing the Sociocultural Self Model of Behavior to Understand and Reduce Inequality**	**The main objective of the project is to identify individual, structural and sociocultural circumstances and processes that contribute to reproducing inequality, study them and interpret in a multidisciplinary, holistic perspective. Our research questions are related to how individual characteristics and structural conditions may influence people's beliefs, attitudes and behavior, how these socioculturally shaped selves that are relevant in a given situation in turn affect the structural conditions of people's sociocultural contexts. As individual characteristics and structural conditions are situated in larger contexts, which reflect particular ecological, economic, political, and historical circumstances, we will study how beliefs on inequalities strengthen by social and political discourse in social networks (families, schools, religious and political groups) and media contribute in reproducing inequalities.**	**Prof. Małgorzata Kossowsk, malgorzata.kossowska@uj.edu.pl**

29	**Faculty of Biochemistry, Biophysics and Biotechnology**	PHOTOSYNTHETIC ACCLIMATION RESPONSES IN PLANTS UNDER ENVIRONMENTAL CHANGES	In the changing world plants play crucial role in maintaining sustainability and ecological balance. Therefore the acclimation responses of photosynthetic system in plants are of great importance. Several aspects of photophysical, photochemical, and biochemical mechanisms will be studied for understanding how plants could tolerate unfavorable environmental factors. Another study will be devoted to developmental changes in photosynthesis under stress (cold, excess light, drought, metal pollution) including chloroplast formation, spatial leaf mesophyll rearrangement, ontogenetic changes in sink-source relations between phototrophic and heterotrophic tissues and organs, and biomass production. A holistic approach including a study from the level of molecules to whole plant, and various complementary techniques (molecular genetics, physico-chemical, and ecophysiological) shall result in better understanding the complex processes leading to plant acclimation One of the specific subjects of common interest with the Russian partners is the role of xanthophyll cycle at the early stages of plant development, in protection of the photosynthetic apparatus against environmental stress. Another topic is the acclimation responses involving antioxidant reactions in plants under the technogenic pollution. Collaboration with Russian partners is very essential to perform successfully such a complex study. The collaborators from Ural Federal University and Jagiellonian University have complementary instrumentation and expertise necessary for such research. The project should allow to intensify the already existing collaboration which resulted, so far, in bilateral visits and several joint publications. The meeting with Russian partners will give us also a possibility to work on a common grant application.	Prof. Dariusz Latowski, dariusz.latowski@uj.edu.pl
30		Integration of best practices to block the overgrowth of toxic cyanobacteria and to eliminate the cyanotoxin occurrence.	The persistence and invasive character of toxic and potentially toxic species of cyanobacteria in aquatic environments are important problems for public health. Several proposals of risk management strategies for cyanobacterial cells and toxins have been described, however the actual utilization of such reports is relatively low. Thus, the main purpose of this application is to optimize the most promising strategies in field experiments. It involves: (i) sampling and monitoring programs providing the best procedures for assessing the risk of toxic algal outbreaks in a water supply and other reservoirs; (ii) strategies for nutrients control in most exposed ecosystems, (iii) treatment strategies including chemical and physical treatment, oxidation and adsorption as well as biological filtration/decomposition. The strategies will be verified both in reservoir and treatment plants to identify potential tools and actions to deal with particular management task. The field experiments should lead to final recommendations regarding the most cost-effective control/treatment strategies for given local conditions when cyanobacteria are present and constitute a real risk.	Dariusz Dzig , PhD, dariusz.dziga@uj.edu.pl
31		EPR imaging	EPR oxygen mapping is used in animal preclinical studies of tumors, heart ischemia and the brain. Technical developments allow at present the transition towards measuring bigger objects. We aim to develop tumor hypoxia mapping in mice, based on the experience of four European groups with expertise in EPR imaging. The Krakow group has many years' experience in technological development, and other groups' expertise will inform the design of resonators. The Krakow, Brussels and Linkoping groups have pre-clinical experience, and Brussels is involved in clinical spectroscopic oximetry in humans (providing pO_2 measurements, but not pO_2 maps). French group has expertise in probe developing.	Prof. Martyna Elas martyna.elas@uj.edu.pl
32		Systemic effects of local inflammatory responses.	General information: RNases are very important in the regulation of transcriptomes of different cells in different conditions. Our main interest is the role of a broad range of RNases, including proteins from the MCPIP family and their activation in the physiological and pathological processes with a main focus on inflammation-related disorders. These include; , cancer, autoinflammatory diseases, neuroinflammatory diseases, and metabolic disorders. We aim to understand how local and systemic changes in RNAse activities impact pathophysiology of specific tissues such as skin, gut, fat depots, central nervous system, and bone marrow.	Prof. Joanna Cichy, joanna.cichy@uj.edu.pl
33		Regulatory mieloid cells in different pathophysiological contexts	General information: Mieloid cells are key but underexplored compartment of immune system in the context of their immunoregulatory role in various immune responses. The aim of this project is to bring together researchers interested in myeloid cells (granulocytes, monocytes, macrophages and dendritic cells) in different pathophysiological contexts (autoimmune diseases, infectious diseases and cancer), and explore phenotypic and functional similarities and differences among these cells across different pathological conditions. Regulatory myeloid cells are found in most of pathological states associated with inflammation, but lack of suitable phenotypic and functional markers, hampers understanding biology of these cells in different contexts. For example, it remains unclear whether immunosuppressive granulocyte described in patients suffering from cancer or autoimmune diseases, phenotypically and/or functionally represent the same cell. The starting point of this collaboration will be bioinformatic analysis of myeloid cells across different inflammatory diseases. Project builds on a previous collaboration among COST Mye-Euniter members.	Prof. Joanna Cichy, joanna.cichy@uj.edu.pl

34		Advanced chemical and biological nanocarriers for tissue regeneration”	Synthetic as well as natural nanocarriers derived from biological specimens represent a novel useful tool for tissue repair. As nanoparticles, they may be designed to better penetrate human tissues, including the blood-brain barrier, to deliver their pharmacological or molecular content to injured tissues. The aim of this interdisciplinary project would be to develop synthetic nanocarriers selectively targeting selected tissue types in combination with bioengineered stem cell (SC)- derived extracellular vesicles (EVs) to enhance their pro-regenerative properties mediated via paracrine action.	Prof. Ewa Zuba Surma, ewa.zuba-surma@uj.edu.pl
35		“A synergistic approach toward understanding and enforcing the biological activity of stem cell- derived extracellular vesicles in tissue repair”	Extracellular vesicles (EVs) represent membrane-enclosed vesicular bodies released by cells including stem cells (SCs), which contain bioactive molecules such as proteins, lipids, mRNAs, miRNAs, and participate in cell-to-cell communication. We have recently reported that induced pluripotent stem cell (iPS)- derived EVs (iPS-EVs) may carry several endogenous and exogenous miRNAs impacting on tissue repair. The aim of this project would be to better understand the role of selected miRNA and lncRNAs carried by iPS-EVs in regulating cellular processes activated in regeneration of certain tissues. We would like to also select molecular factors to be overexpressed in iPS-EVs to enhance thier pro-regenerative properties, which would bring us closer to their practical future applications. Extracellular vesicles (EVs) represent membrane-enclosed vesicular bodies released by cells including stem cells (SCs), which contain bioactive molecules such as proteins, lipids, mRNAs, miRNAs, and participate in cell-to-cell communication. We have recently reported that induced pluripotent stem cell (iPS)- derived EVs (iPS-EVs) may carry several endogenous and exogenous miRNAs impacting on tissue repair. The aim of this project would be to better understand the role of selected miRNA and lncRNAs carried by iPS-EVs in regulating cellular processes activated in regeneration of certain tissues. We would like to also select molecular factors to be overexpressed in iPS-EVs to enhance thier pro-regenerative properties, which would bring us closer to their practical future applications.	Prof. Ewa Zuba Surma, ewa.zuba-surma@uj.edu.pl
36		Physiological and biotechnological aspects of photosystem I oligomerization in cyanobacteria	In thylakoid membranes of many cyanobacteria, including a mesophilic model organism Synechocystis PCC6803, photosystem I reaction centers are organized as monomers and trimers. A a subunit of the PS I RC’s, 16 kDa hydrophobic protein - PsaL, was identified as crucial for the formation of PS I trimers. We have studied the physiological effects accompanied by PS I oligomerization, using a PsaL- deficient mutant (ΔpsaL), not able to form PS I trimers, grown at various temperatures (Plant &Cell Physiology, 2015). The scientific objectives for the planned cooperation are the determination of the structure and functioning Synechocystis DpsaL mutant with monomerized photosystem I. The effects of PS I trimer elimination on chemical composition and physical properties of thylakoid membranes and will be studied with the methodologies of EPR-based spin labeling and profiling of important metabolites (fatty acids, lipids, carotenoids etc.) and approaches to the transcriptomics, TEM/SEM, and cryo-electron microscopy. We expect to obtain the results to support our hypothesis that the PS I trimer in cyanobacteria may play a crucial role in stabilization of native structure of thylakoid membranes. The large complexes of PS I oligomer may force lamellar structure e.g. by limiting the space available for MGDG, thus preventing the formation of the inverted hexagonal phase of lipids. Consequently, a novel, structural function of PS I oligomers in cyanobacteria could be proposed. Also, it would lead to the iidentification of cyanobacterial metabolites, which biosynthesis and accumulation is affected by monomerization of photosystem I and which are potentially applicable to be used biotechnologically.	Prof. Ewa Zuba Surma, ewa.zuba-surma@uj.edu.pl
37	**Faculty of Pharmacy**	Fatty acid metabolism and transport in tumour microenvironment	In the frame of the project we propose to study the metabolism and transport of fatty acids (FAs) in tumour microenvironment in murine model of metastatic breast cancer. We suppose that the degree of FAs accumulation in primary tumour is strongly dependent on metabolism and transport mechanisms. In this respect the influence of triglyceride forming enzymes, the repertoire of triglyceride breakdown enzymes on FAs synthesis, and the expression of fatty acid transporters in tumour microenvironment will be developed. Numerous studies indicate that excess of free fatty acids are toxic, whereas neutral triglycerides are not. The crosstalk between different tissues and cells that promotes dysfunction is well documented but little is known how fatty acids metabolism and transport influence tumour microenvironment. Considering these issues we would like thoroughly investigate 1) how primary tumour metabolize and store FAs, 2) which proteins modulate FAs transport to the primary tumour, 3) are all FAs taken by the primary tumour, 4) are all FAs toxic to the primary tumour? Taken together, the question is, in what way environment of primary tumours in breast cancer acquire fatty acids? Is it an endogenous synthesis or release and absorption of fatty acids from dietary sources, and which FAs are preferentially sealed in tumours?	Prof. Maria Walczak, maria.walczak@uj.edu.pl

38	**Faculty of Medicine**	Tumor-derived extracellular vesicles in colon cancer.	According to World Cancer Research Fund colorectal cancer (CRC) is the third most common cancer in the world with more than 1.8 million new cases diagnosed in 2018. Research on the mechanisms by which tumors escape immunosurveillance led to the assumption that extracellular vesicles (EVs) might be involved. It has been shown that tumor cells release their own EVs in order to communicate with neighbouring tumor cells, as well as with other non-tumor cells in the body. One of the hypothesis behind EVs release by tumors is the enhancement of immunosuppression observed during cancer development and stimulation of the metastatic potential of the parental tumor cells. These mechanisms involve among others transportation of miRNAs, RNAs and proteins responsible for silencing anti-tumor immune response, induction of regulatory myeloid cells or regulatory (type2) macrophages and/or regulatory T cells. The project objective is to characterize and analyse interactions of colon cancer derived EVs (obtained both from colon cancer cell lines and cancer patients) with human immune cells (monocytes, dendritic cells) to determine possible mechanisms of tumor progression related to cancer-derived EVs in this type of cancer. This will involve both in vitro and in vivo animal models. Effect of the applied therapy on the level of cancer-derived EVs in patients plasma is planned to be analysed as well. The obtained results may lead to discovery of new biomarkers useful for monitoring colon cancer development and treatment.	Prof. Jarosław Baran, jarek.baran@uj.edu.pl
39		Genetic variants of stroke recovery. The International Stroke Genetics Consortium Global Alliance of acute and long-term outcome studies	International Stroke Genetics Consortium (ISGC) is an international research organization, that is focused on studying genes that affect stroke risk and its sequel. The ISGC has held its international workshop every six months and have regular phone call discussions. The ISGC was able to achieve several grants which resulted in more than 100 papers in highly impacted papers. Members of ISGC just recently set up a new working group "the International Stroke Genetics Consortium Global Alliance of acute and long-term outcome studies" headed by Israel Fernandez Cadenas (Barcelona) and Arne Lingren (Lund) that is focused on studying genetic markers responsible for stroke recovery. So far, several European stroke centers plan to join this initiative. Some members of the Global Alliance just recently showed the first genetic variant that affects stroke recovery https://doi.org/10.1212/WNL.0000000000007138. The authors performed retrospective meta-analysis of 12 studies that included 6,165 genotyped patients with ischemic stroke followed for 3 months. The genetic variant, identified as rs1842681 in the LOC105372028 gene, can be linked to another gene that is part of a major process involved in brain plasticity. This result is very important since in the future protein product of this gene may be a target for medication that improve stroke outcome. The Global Alliance plan to perform a new prospective, international, multicenter study looking for other genes that may affect stroke outcome. To achieve this, data from more than 10 000 stroke patients should be collected. Prof Agnieszka Słowik, who is a head of the Department of Neurology in Krakow, and currently a member of the Steering Committee of the ISGC has been invited to participate in this effort. The following data will be collected from all stroke patients who agree to participate: demographics, stroke risk factor profile, standardized clinical and radiological data. All patients will be follow for at least 3 months. In each case GWAS study will be performed.	Prof. Agnieszka Słowik; agnieszka.slowik@uj.edu.pl
40		Factors affecting graft function after allogenic stem cell transplantation.	Bone marrow failure (BMF) syndromes are severe complications after hematopoietic stem cell transplantation affecting procedure outcome. BMF can be distinguished into two categories poor graft function (PGF) and graft failure (GF). In both, different mechanisms of the interactions between the immune system and hematopoietic compartment play a role. Furthermore, variety of factors may predict BMF in literature. The aim of a study is to analyze factors connected with poor graft function and secondary graft failure after allogeneic stem cell transplantation in adult patients. Primary, retrospective analysis will be performed in a cohort of patients subjected to related and unrelated donor transplants in two centers Krakow and Bergen, transplanted 2013-2018. Influence of diagnosis, stem cell source, graft parameters (CD34+, MNC) and CD3 content, patient/donor age, CMV patient/donor status and CMV reactivation/treatment, ABO patient/donor compatibility, conditioning (MAC vs RIC vs NMA), HLA patient/donor matching, GVHD prophylaxis and GVHD occurrence, immune recovery status at the time of poor graft function, occurrence of relapse will be analyzed in univariate and multivariate analysis. Based on results of risk factors multivariate analysis and transplant outcome data, it will be possible to distinguish patients into BMF risk groups. Second part of the study is prospective analysis of lymphocyte, NK cell and monocyte subpopulation in peripheral blood and bone marrow myeloid derived suppressor cells in two groups of patients subjected to allogeneic stem cell transplantation – with and without high risk BMF features in post-transplant period to predict BMF to evaluate possible differences.	Patrycja Mensah-Glanowska, PhD, patrycja.mensah-glanowska@uj.edu.pl

		Significance of epithelial - mesenchymal transition transcription factors in epithelial and non-epithelial tumors.	We are interested in numerous factors responsible for tumor growth including growth factors, surface receptors, transcription factors and microRNAs. Our studies are focused on the role of myogenic factors, EMT (epithelial to mesenchymal transition) related transcription factors and miRNAs in tumor growth. We perform research using three tumor cell types: rhabdomyosarcoma, colorectal carcinoma and cervical carcinoma. Rhabdomyosarcoma (RMS) is a soft tissue tumor, which may originate from stem cells due to their differentiation defect. We are interested in defining the role of EMT-related factors in RMS biology to get a deeper insight into the complexity of interactions between EMT-related factors, different proteins and microRNA in regulation of RMS development, growth and progression. Ongoing studies are looking for a correlation between the activity of individual miRNAs and the onset and/or progression of tumor to define the role of miRNA in pathogenesis and progression of colorectal cancer (CRC). We are also interested in interaction between miRNAs and EMT-related factors. In cervical carcinoma we are interested in similar studies and evaluation of the role of AMP-activated kinase (AMPK) which acts main energetic switch of a single cell as well as full organism. Our studies may open the possibility to design the specific molecular tools, which can be applied in the future clinical trials aimed at preventing tumors growth. We could discover novel mechanisms underlying biology of tumors originating from defective differentiation of stem cells.	Prof. Marcin Majka; marcin.majka@uj.edu.pl
		Mechanisms and possibility of central nervous system regeneration.	"Neurodegenerative diseases affect growing number of elderly people. Among neurodegenerative disorders Parkinson's Disease (PD) is the second most common. In PD specific loss of dopamine-producing (dopaminergic) neurons takes place. The exact etiology of Parkinson's Disease is not fully elucidated, and study conducted to date suggests several hypothesis e.g. environmental factors, genetic lesions or involvement of immunological system causing chronic inflammation that results in degeneration of dopaminergic neurons. For majority of patients there is no efficient treatment available today, and available chronic pharmacotherapy is far from perfect and its efficiency deteriorates in time. Data collected during this study will extend our knowledge about the mechanism responsible for development of PD and might help to develop personalized, cellular regenerative therapy. Chronic or permanent damage to brain structures by various factors is called encephalopathy. The main two causes that often lead to encephalopathy in childhood are mechanical damage or bacterial infections. The consequences of brain damage at such a young age are motor disabilities as well as neurological disorders including epilepsy. Pathomechanisms of the central nervous system damage that lead to the encephalopathy and subsequent dysfunctions are largely unknown. Our lab is focused on finding new ways to treat encephalopathy and its complications using stem cells-based approach and immunomodulation strategy. "	Prof. Marcin Majka; marcin.majka@uj.edu.pl

		Fighting cardiovascular diseases with adult stem cells	"Despite the extensive progress of conventional medicine in the diseases treatment, mostly due to the major advances in the field of pharmacology and disease early diagnosis and prevention, large numbers of patients suffering from civilization diseases who have reached 'untreatable' stage are still awaiting for development of an effective treatment while they are a substantial burden to themselves, their families and the society. This is particularly true for cardiovascular diseases where in spite of a significant improvement that has occurred in the last decade in prevention, pharmacotherapy, and rehabilitation, those remain a key cause of death and disability in the modern society that rival many cancers (Roger Circ Res 2013, Jeon YH BMC Health Serv Res 2010, Bui Al et al Nature Rev Cardiol 2011). Although early diagnosis and prompt revascularization treatment reduce the degree of ischemic injury, current strategies are unable to reverse the ischemic damage that has already occurred. Social and personal costs of living with heart failure are, paradoxically, on the increase (Jeon YH BMC Health Serv Res 2010) because of development of palliative rather than causal therapies, with a significant proportion of patients, on the one hand, unable to work and, on the other, requiring repeated hospitalizations due to heart failure exacerbations (Bu AL et al Nat Rev Cardiol. 2011). In Poland, clinical heart failure currently affects 1 million citizens and, unless disease-reversing treatment is developed, this number will escalate to 1,25 million by 2035 (www.zdrowie.pl, www.pzh.gov.pl). The project "Cardiovascular ischemic injury regeneration using Wharton Jelly as unlimited therapeutic stem cells source" (CIRCULATE) proposes a new approach for the treatment of selected cardiovascular diseases based on use of allogeneic transplantation of Wharton's Jelly derived Mesenchymal Stem Cells (WJMSC). "	Prof. Marcin Majka; marcin.majka@uj.edu.pl
41		Tumor biology.	We are interested in numerous factors responsible for tumor growth including growth factors, surface receptors, transcription factors and microRNAs. Our studies are focused on the role of myogenic factors, EMT (epithelial to mesenchymal transition) related transcription factors and miRNAs in tumor growth. We perform research using three tumor cell types: rhabdomyosarcoma, colorectal carcinoma and cervical carcinoma. Rhabdomyosarcoma (RMS) is a soft tissue tumor, which may originate from stem cells due to their differentiation defect. We are interested in defining the role of EMT-related factors in RMS biology to get a deeper insight into the complexity of interactions between EMT-related factors, different proteins and microRNA in regulation of RMS development, growth and progression. Ongoing studies are looking for a correlation between the activity of individual miRNAs and the onset and/or progression of tumor to define the role of miRNA in pathogenesis and progression of colorectal cancer (CRC). We are also interested in interaction between miRNAs and EMT-related factors. In cervical carcinoma we are interested in similar studies and evaluation of the role of AMP-activated kinase (AMPK) which acts main energetic switch of a single cell as well as full organism. Our studies may open the possibility to design the specific molecular tools, which can be applied in the future clinical trials aimed at preventing tumors growth. We could discover novel mechanisms underlying biology of tumors originating from defective differentiation of stem cells.	Prof. Marcin Majka; marcin.majka@uj.edu.pl
42		Immune responses in pathophysiology of inflammatory heart disorders.	We are interested in innate and adaptive immune responses in pathophysiology of inflammatory heart disorders and in molecular mechanisms of fibrogenesis. Main experimental model: mouse model of experimental autoimmune myocarditis. Main areas of interest: 1) cellular and molecular mechanisms of inflammatory dilated cardiomyopathy, 2) molecular mechanisms of cardiac fibrogenesis, 3) microvascular dysfunction in cardiac disorders.	Prof. Przemysław Błyszczuk; przemyslaw.blyszczuk@uj.edu.pl

43		NGS approach in methylation analysis of CD146 gene: searching for novel epigenetic markers in breast and prostate cancer.	CD146 was initially described in 1987, as a protein involved in invasion and progression of malignant melanoma1. Recently, the aberrant expression of CD146 has been implicated in progression and poor overall survival of many cancers including breast and prostate cancer. Importantly, in breast and prostate cancers independent studies reported CD146 as an inducer of Epithelial to Mesenchymal transition. Although it is well established that CD146 contributes to the aggressiveness of tumors by promoting malignant cell motility, still little is known about the regulation of its expression in cancer. Thus far it has been proved that increased expression levels of CD146 in tumor tissues is not due to translocation, amplification or mutation of the CD146 gene. From the other site, our data strongly suggest that epigenetic mechanism, exactly DNA methylation is involved in the regulation of CD146 expression in breast and prostate tumors (Kocemba et al. Prostate 2016, Dudzik et al. Anticancer Research. 2019) As overexpressed CD146 is considered oncogenic, the methylation-based silencing of its expression in cancer cells seems to be quite surprising. According to our hypothesis, at the beginning of the disease CD146 may be targeted for aberrant promoter methylation/or has been already methylated in consequence of tissue specific epigenetic silencing, whereas the loss of methylation at subclonal level, in advanced tumor unleashes the CD146 expression leading to metastasis. In frame of potential cooperation we would like to perform the detailed analysis of CD146 promoter methylation (deep sequencing) in relation to its expression level and the progression stage of breast and prostate cancer patients. These data are of very high importance since if methylation indeed traps expression of EMT inducer at the beginning of the disease, this epigenetic modification may provide the bases for novel therapies and diagnostic approach focusing on early detection of metastatic transformation in these tumors.	Kinga Kocemba-Pilarczyk, PhD; kinga.kocemba@uj.edu.pl