TABLE 9 – PhD Programme in BIOMEDICAL SCIENCES AND BIOTECHNOLOGY

THE PhD PROGRAMME	
Administrative location	University of Udine, Department of Medical Area (DAME) –via Colugna 50, 33100 Udine, ITALY (tel. +39 0432 494301).
Associated location	C.R.O. - Centro di Riferimento Oncologico (National Cancer Institute Aviano) – via Franco Gallini 2, 33081 Aviano (PN) ITALY.
Location for training, teaching and research activity	Teaching and other training activities will take place primarily at the administrative programme location or in other locations of the University of Udine. The research program will be mainly developed, with reference to the assigned scholarship, at one of these locations: administrative location, enterprise.
Coordinator	Prof. Claudio Brancolini (claudio.brancolini@uniud.it)
Programme duration	3 years
Curriculum	-
Programme website	https://www.uniud.it/it/ateneo-uniud/ateneo-uniud-organizzazione/dipartimenti/dame/ricerca/dottorati/biomedical-biotechnological-sciences

ADMISSION REQUIREMENTS	
Required degree	Italian Laurea (before DM 509/99) or Italian Laurea Specialistica/Magistrale (ex DM 509/1999 and DM 270/04). Foreign degrees and titles: refer to art. 3 and 4 of the Call.
Knowledge of the following foreign language	English

DOCUMENTS AND TITLES TO BE ATTACHED TO THE APPLICATION FOR ADMISSION	
Compulsory documents (art. 5 of the Call)	1. Certification or self-certification (refer to art. 5 paragraph 5 of the Call) of the academic title needed for admission to the PhD programme and list of the exams (with grades) passed during the Italian first level (bachelor) and the Laurea Specialistica/Magistrale programmes or during the Italian programmes before D.M. 509/99 or during the foreign academic programmes; 2. Curriculum vitae et studiorum, dated and signed; 3. Copy of a valid identity document (citizens of countries not belonging to the European Union a copy of a valid passport, comprehensive of the pages containing the holder's photo, personal details, passport number, date and place of issue, date of expiry); 4. A research project, dated and signed, developed in accordance with the description of the research topic of interest, which highlights the contribution that the applicant can offer to the development of the same topic (approximate limit 10,000 characters, spaces included).
Optional documents (art. 5 of the Call)	1. Master thesis ("Tesi di Laurea") associated to the degree/title providing access to the PhD programme. Applicants who are not graduated on the expiration date of this Call can submit an extended abstract in place of the complete thesis, in Italian or English language, signed by themselves and by their thesis Supervisor (approximate limit: 25,000 characters, spaces included); 2. Motivation letter by which the applicant explains the reasons for admission to the PhD programme, dated and signed (approximate limit: 1,000 characters, spaces included); 3. Publications (max 2); 4. Letters of reference (max 2) written by university professors, scientific researchers or other experts in the field (art. 6 of the Call).

SELECTION COMMITTEE	
Appointed Members	Bruno Grassi – Full professor – University of Udine Monica Colitti – Associate Professor – University of Udine Claudio Brancolini – Full professor – University of Udine
Substitute Members	Claudio Schneider – Full professor – University of Udine Alessandra Corazza – Associate professor – University of Udine

ADMISSION
GENERAL COMPETITION (art. 8 of the Call for Applications)
Positions available: 4

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Detailed description	*N.*	*Funding*	*Annual gross amount*	*Period abroad*	*Period in enterprise (indentified by the Univ. of Udine)*	*Research Topic*
Positions WITH SCHOLARSHIP: 4	**1**	National Operational Program (PON) Research and Innovation 2014-2020 "Education and research for recovery – REACT-EU" (M.D. 1061/2021) and University of Udine	€ 15.343,28	max 6 months optional	min 6 - max 12 months mandatory	1.1 Green Topic "Development of novel anti-neoplastic approaches to reduce the impact of mutagenic chemotherapeutics in the environment" (PON RI 2014/2020 Axis IV Action IV.5)
	1	National Operational Program (PON) Research and Innovation 2014-2020 "Education and research for recovery – REACT-EU" (M.D. 1061/2021) and University of Udine	€ 15.343,28	-	min 6 - max 12 months mandatory	1.2 Green Topic "Green Molecular Diagnostics Lab" (PON RI 2014/2020 Axis IV Action IV.5)
	1	National Operational Program (PON) Research and Innovation 2014-2020 "Education and research for recovery – REACT-EU" (M.D. 1061/2021) and University of Udine	€ 15.343,28	-	min 6 - max 12 months mandatory	1.3 Green Topic "Sustainable mobility in Udine. A bicycle network to promote environmental sustainability and improve health" (PON RI 2014/2020 Axis IV Action IV.5)
	1	National Operational Program (PON) Research and Innovation 2014-2020 "Education and research for recovery – REACT-EU" (M.D. 1061/2021) and University of Udine	€ 15.343,28	-	min 6 - max 12 months mandatory	1.4 Green Topic "The use of nutraceutics and the study of functional foods" (PON RI 2014/2020 Axis IV Action IV.5)

Competition procedure and test schedule			
Evaluation of qualifications and oral examination. For the evaluation of applicants' attitude for scientific research and their knowledge to develop the topic of interest, the Selection Committee can attribute up to 100 points to each applicant: max 30 points to the qualifications and max 70 points to the oral examination. Applicant is admitted to the interview if his/her qualifications receive at least 15 points. The oral examination is passed with at least 49 points. The applicant is eligible to the PhD programme if he/she passes the oral examination. Only for eligible applicants, the points attained in in the oral examination will be added to the points of the qualifications. Scholarships are assigned according to the provisions of art. 10 of the Call. **DATE FOR THE PUBLICATION OF THE ADMITTED APPLICANTS TO THE INTERVIEW: within November 3, 2021** **DATE FOR THE PUBLICATION OF THE FINAL RANKING LIST: within November 11, 2021**			
Foreign language that can be used for examination	Italian or English		
Evaluation Criteria of qualifications *During the preliminary meeting the Selection Committee may establish sub-criteria for the evaluation*	Curriculum vitae		*9*
	Scientific publications		*2*
	Thesis/Abstract		*4*
	Research project		*15*
Oral examination	Part of the oral examination will be in English.		
Calendar of the oral examination	**Date**	**November 4, 2021**	
	Time	02:00 pm	
	How to conduct the examination	The oral examination will be held online (MS Teams)	
	Based on the number of applicants, the oral examination may take more than one day. Applicants must exhibit a valid ID.		

Research Topics Description
Research Topic 1.1: Development of novel anti-neoplastic approaches to reduce the impact of mutagenic chemotherapeutics in the environment.

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The project aims to identify new anti-neoplastic compounds that are characterized by an absence/reduced DNA damage activity. The classic chemotherapeutic agents and in particular drugs that induce DNA damage are still irreplaceable tools for the treatment of many neoplastic diseases. Many studies have detected traces of these agents in the rivers and seas of several countries. Environmental contaminations are particularly critical in the case of mutagenic agents which induce DNA damage (genotoxic agents) and thus promote carcinogenesis. A library of 1593 compounds obtained from the Diversity set (National Cancer Institute USA) will be screened to identify new anti-neoplastic compounds. The different compounds will be selected for cytotoxic action in the absence of DNA damage on human cancer cells by immunofluorescence assay, using the DNA damage marker phosphorylated histone H2AX. To select only compounds with selective action towards neoplastic cells, the most promising hits will be next evaluated for the absence of cytotoxic action towards normal cells. Subsequently, the mechanisms of action will be characterized through the definition of changes in gene expression. Finally, with the aim of reducing environmental contaminations, innovative delivery systems will be developed to increase efficacy and thus reducing dosage.

Research Topic 1.2 - Green Molecular Diagnostics Lab
Streamlining of the complex procedures for NA/NucleicAcids isolation from various biological/clinical samples for molecular diagnostics represent a most critical target to limiting the use of disposable plasticware as well as to increasing analitycal sensitivity and to decreasing response-time also for Point-of-Care assay-customization. The present 'gold-standard' methodology for NA extraction/purification is based on lengthy procedures requiring high plasticware consumption. This project is based on a single-step methodology already optimized for RNA extraction/purification from nasopharyngeal swabs. The present project will extend and tailor the use of such single-step methodology to various types of biological samples including saliva, needle-aspiration, plasma, blood. Separation and purification of exosomes from blood will also be approached.

Research Topic 1.3: Sustainable mobility in Udine. A bicycle network to promote environmental sustainability and improve health
The aim of the Project are: quantify energy expenditure and other physiological variables associated with bicycle use along typical urban and extraurban paths in Udine; quantify daily transportation by bicycle and by car to and from Udine downtown; evaluate the effects on health status and risk of diseases associated with the use of a bicycle vs. the use of a car. In parallel, the Project will estimate the potential impact of an expansion of bicycle paths in Udine, in terms of the reduction of CO2 emissions and health-related costs, and will lead to a new proposal for bicycle paths in Udine, potentially applicable also to other urban areas.

Research Topic 1.4: The use of nutraceutics and the study of functional foods
The project aims to evaluate the bioactivity of functional compounds by in vitro studies on specific human and animal cellular models. The research will expand the in vitro study of cellular and biomolecular response to natural nutraceuticals and other functional compounds in terms of proliferation, differentiation apoptosis and autophagy. Oxidative stress and deregulation of the mTOR pathway is a common theme among neurodegeneration, cancer, diabetes, and physiological aging, suggesting that the protective effects of functional compounds in various disorders may occur through a shared molecular mechanism. As an example, will be tested natural polyphenols, such as oleuropein, present in olive oil with anti-inflammatory, antioxidant and immunomodulating proprieties.
The evaluation of the effectiveness of natural bioactive compounds will contribute to the development of knowledge on new functional foods and bioactive compounds to be used as supplements or support to therapies of communicable diseases (Ncds), such as sarcopenia and obesity. Using natural bioactive compounds in infectious and stress diseases will contribute to the reduction of the use of drugs, especially antibiotics, with positive effects on microbial resistance and biodiversity. Results will allow the technology transfer to industry to produce new concepts that will also increase the knowledge of nutrigenomics for the development of a personalized medicine.