



## ZNANSTVENI TURIZAM SCIENCE TOURISM



### HRVATSKA U SREDIŠTU SVJETSKE ZNANSTVENE POZORNOSTI CROATIA IN THE CENTRE OF ATTENTION OF WORLD SCIENCE

Svjetska znanstvena elita doletjela je u Dubrovnik. Jubilarni deseti kongres pod nazivom *The Tenth ISABS Conference on Forensic and Anthropologic Genetics and Mayo Clinic Lectures in Individualized Medicine* okupio je oko 500 sudionika iz 40-ak država svijeta, a najatraktivnije teme iz područja personalizirane medicine te forenzične i antropološke genetike obradilo je više od 60 pozvanih predavača, s najuglednijih svjetskih znanstvenih institucija. Hrvatska je tako u lipnju postala središte svjetske znanosti.

The world's scientific elite is about to land in Dubrovnik. The jubilee Tenth ISABS Conference on Forensic and Anthropologic Genetics and Mayo Clinic Lectures in Individualized Medicine is gathering some 500 participants from about 40 countries from around the world. The most fascinating topics in the field of individualised medicine, and forensic and anthropologic genetics will be tackled by over 60 invited lecturers arriving from the most prestigious world institutes of science. And so in June, Croatia is becoming the centre of the world of science.

Piše/By: Ksenija Žlof Fotografije/Photos: Arhiva/Archive of Prof. Dragan Primorac

**K**ad je prije 20 godina, tijekom održavanja Američke akademije za forenzične znanosti u New Yorku, prof. dr. Dragan Primorac predložio pokretanje znanstvenih događanja (tada pod nazivom *European American Intensive Course in PCR Based Clinical and Forensic Testing*) u Hrvatskoj, koja bi zbog svoje geografske pozicije mogla biti pogodno mjesto susreta američkih i europskih znanstvenika, malo je tko mogao pretpostaviti da će ideja prerasti u jedan od najprepoznatljivijih svjetskih znanstvenih događaja iz područja medicinskih i primijenjenih bioloških znanosti. Od samog početka s prof. dr. Primorcem u organizaciju znanstvenih događaja, što će poslije prerasti u ugledne ISABS-ove kongrese, uključio se prof. dr. Moses

Schanfield sa Sveučilišta *George Washington* te Stanimir Vuk Pavlović s *Mayo Clinic*, kao i prof. dr. Šimun Andelinović, današnji rektor Sveučilišta u Splitu, prof. dr. Henry Lee sa Sveučilišta New Haven i prof. dr. Mitchell Holland sa Sveučilišta Penn State. Od 2013. godine organizaciju programa iz područja kliničkog dijela kongresa preuzeo je prof. dr. Tamas Ordog s *Mayo Clinic*, a strukturiranje programa iz područja forenzičnih i antropoloških znanosti prof. dr. Manfred Kayser sa Sveučilišta Erasmus. Kongresi, koje organizira *International Society for Applied Biological Sciences (ISABS)*, do sada su okupili više od 4000 znanstvenika i oko 550 pozvanih predavača iz ukupno 70-ak država. Punih 14 godina program kliničkog dijela kongresa

organizira vodeća američka zdravstvena institucija *Mayo Clinic*, o čijoj snazi najbolje govori podatak da u njoj radi oko 64.000 zaposlenika, da su joj prihodi veći od 10.3 milijarde dolara, te da je prema *U.S. News & World Report List 2016-2017* proglašena najboljom američkom bolnicom. U Dubrovnik na ovogodišnji kongres stiže i potpredsjednik *Mayo Clinic* prof. dr. Gianrico Farrugia, čije predavanje o translaciji rezultata temeljnih medicinskih znanosti, posebice iz područja personalizirane medicine u kliničku praksu, privlači veliku pozornost. U organizaciju ISABS-ovih kongresa, kao partner institucija, uključena je i vodeća svjetska forenzična organizacija *Američka akademija za forenzične znanosti (AAFS)*, u čijim je redovima više od 7000 forenzi-



01 Prof. dr. Robert Huber, dobitnik Nobelove nagrade iz kemije 1988., prof. dr. Dragan Primorac i prof. dr. Henry C. Lee, vodeći američki forenzičar  
 Prof. Robert Huber, winner of the Nobel Prize for Chemistry in 1988, Prof. Dragan Primorac and Prof. Henry C. Lee, a leading American forensicist

02 Prof. dr. Dragan Primorac i prof. dr. Ada Yonath, dobitnica Nobelove nagrade iz kemije 2009.  
 Prof. Dragan Primorac and Prof. Ada Yonath, winner of the Nobel Prize for Chemistry in 2009



čara iz cijelog svijeta. Tijekom nedavne godišnje akademije, koja se u veljači 2017. godine održala u New Orleansu, AAFS je ISABS proglasio pridruženom organizacijom, a takvu je odluku AAFS u svojoj povijesti donio samo dvaput.

#### Put u medicinu 22. stoljeća prolazi kroz Dubrovnik

Tako od 19. do 24. lipnja Hrvatska postaje središte svjetske znanstvene pozornosti, a jubilarni deseti kongres pod nazivom *The Tenth ISABS Conference on Forensic and Anthropologic Genetics and Mayo Clinic Lectures in Individualized Medicine* [www.isabs.hr](http://www.isabs.hr), u Dubrovniku je okupio oko 500 sudionika iz 40-ak država svijeta. Kongres organiziraju ISABS, Mayo Clinic, te Specijalna bolnica Sveta Katarina, u suradnji s AAFS-om. Partneri institucije jesu Royal Philips, jedna od vodećih korporacija iz područja zdravstvene industrije, Hrvatska liječnička komora i Hrvatsko društvo za humanu genetiku, a pokrovitelj je događaja Hrvatska akademija znanosti i umjetnosti. Snažnu potporu organizaciji događaja pružili su Ministarstvo turizma Republike Hrvatske, Ministarstvo znanosti i obrazovanja Republike Hrvatske, Ministarstvo zdravstva, Hrvatska turistička zajednica, Hrvatska gospodarska komora, PBZ, Croatia osiguranje, Tele 2, HEBE, d.o.o., Ballograf, Adriatic Luxury hotels, Dubrovački muzeji, Grad Dubrovnik, Grad Zagreb, Grad Solin, Arona, Pliva, Belupo, Hrvatska elektroprivreda, Podravka, JANAF, Građa, ALPHACHROM, Jaguar, Land Rover, itd. Najatraktivnije teme iz područja personalizirane medicine te forenzične i antropološke genetike obradilo je više od 60 pozvanih predavača, koji dolaze s najuglednijih svjetskih znanstvenih institucija, poput Mayo Clinic, Harvard School of Medicine, The Technion - Israel Institute of Technology, University of Cambridge, Duke University, University of New Haven, National Institutes of Health-NIH, Max Planck Institute, Thomas Jefferson University, Weizmann Institute of Science, George Washington University, Penn State University, Cleveland Clinic itd. Uz vodeće svjetske znanstvenike u radu kongresa sudjeluje i troje dobitnika Nobelove nagrade: prof. dr. Ada E. Yonath, prof. dr. Robert Huber i prof. dr. Harald zur Hausen. Rezultati njihovih

istraživanja bitno su pridonijeli razumijevanju temeljnih mehanizama iz područja stanične biologije kao i nastanka bolesti. Prof. dr. Ada Yonath prva je Izraelka i prva žena na Bliskom istoku koja je dobila Nobelovu nagradu za znanost te prva žena u 45 godina, koja je dobila Nobelovu nagradu za kemiju. Predmet su njezinih istraživanja bili ribosomi, stanične organele koje imaju ključnu ulogu u prevođenju RNA u protein. Prof. dr. Harald zur Hausen za svoja je istraživanja raka grlića maternice i uloge ljudskog papiloma virusa (HPV) u nastanku te bolesti nagrađen Nobelovom nagradom. Prof. dr. Robert Huber prvi je izveo kristalizaciju intermembranskoga proteina, koji je veoma važan za fotosintezu u bakterijama, a istodobno je odredio i njegovu strukturu. Tijekom rada *The Tenth ISABS Conference on Forensic and Anthropologic Genetics and Mayo Clinic Lectures in Individualized Medicine* zajedničkom sekcijom ISABS i AAFS predsjedava Susan Ballou, koja u veljači sljedeće godine preuzima vođenje *Američke akademije za forenzične znanosti*, a glavna je tema strateške suradnje *Američke akademije za forenzične znanosti i ISABS-a*, ali i razvoja međudržavne suradnje forenzičara u borbi protiv svih vrsta kriminala. Fokus je kongresa na personaliziranoj i regenerativnoj medicini, staničnoj i genskoj terapiji, farmakogenomici, molekularnoj dijagnostici, mikrobiomu, te antropološkoj i forenzičnoj genetici.

#### Personalizirana medicina

Nedvojbeno je da personalizirana medicina predstavlja put u medicinu 22. stoljeća. *Prava terapija za pravog pacijenta u pravo vrijeme* najjednostavnija je definicija personalizirane medicine. Zasnovana je ne samo na razumijevanju analize genoma, proteina i glikana, nego i na razumijevanju utjecaja okoliša na ljudsko zdravlje, sve u svrhu pružanja rane dijagnostike te optimalnog liječenja. Snaga personalizirane medicine temelji se na poznavanju procesa na molekularnoj razini, on u konačnici omogućava i najpreciznije rješenje kroz koncept tzv. precizne medicine. Sastavni dio personalizirane medicine postaje stanična terapija te regenerativna medicina. Personalizirana medicina, u čijemu je sklopu i stanična terapija te regenerativna medicina,



posljednjih godina doživljava veliki zamah. O važnosti personalizirane medicine upravo govori podatak da je Europska komisija osnovala *International Consortium of Personalized Medicine (ICPerMed)*, a RH hrvatski klaster konkurentnosti personalizirane medicine. Vrlo često kao jedna od sastavnica koncepta personalizirane medicine spominje se i farmakogenetika, čiji je cilj pravodobno prepoznati promjene unutar gena odgovornih za metabolizam lijeka te sukladno tome primijeniti optimalnu terapiju. Podatak koji je prije objavljen u američkom časopisu JAMA upozorava da se godišnje samo u SAD-u hospitalizira oko 2,200.000 pacijenata zbog komplikacija povezanih uzimanjem lijekova, te da više od sto tisuća njih umre zbog posljedičnih komplikacija. Cilj je farmakogenomike to prevenirati. ISABS tradicionalno nagrađuje najbolje svjetske mlade znanstvenike mlade od 40 godina nagradom *Young Investigator Award*. Od ove godine prvi put ISABS u suradnji s Hrvatskom agencijom za odgoj i obrazovanje te Ministarstvom znanosti i obrazovanja Republike Hrvatske nagrađuje najbolje radove hrvatskih srednjoškolaca. Radovi moraju biti iz područja humane biologije, genetike i kemije. ISABS također nagrađuje sve nastavnike-mentore učenika koji osvoje nagradu. Nagrađeni srednjoškolci dobivaju odgovarajuću potvrdu, besplatan hotelski smještaj te besplatnu registraciju za sudjelovanje na svim sesijama konferencije, uključivši predavanja dobitnika Nobelove nagrade, svečanost otvaranja i gala večeru.

- Najbolji način da predvidimo budućnost jest taj da je sami kreiramo. Zbog toga nam je osobito drago što su se i naši učenici, koji su naša budućnost, mogli sresti s nobelovcima i najuglednijim svjetskim znanstvenicima. Sve je to prilika da još jedanput pokažemo kako Hrvatska cijeni izvrsnost. Naša je zemlja prelijepa, i u to su se već dosad uvjerali mnogi posjetitelji iz svih krajeva svijeta. Ali, prirodne smo ljepote naslijedili, pa za njih nismo toliko zaslužni, a za naš udio u znanosti jesmo. Ovaj kongres, koji okuplja svjetsku znanstvenu elitu, još je jedna potvrda da je uistinu tako - rekao je prof. dr. Dragan Primorac. ►

When 20 years ago, during an American Academy of Forensic Sciences conference in New York, Prof. Dragan Primorac proposed setting up and organising a series of scientific conferences (then called the European American Intensive Course in PCR Based Clinical and Forensic Testing) in Croatia, which could - owing to its geographic position - be a suitable place for meetings of American and European scientists, no one could have guessed that the idea would turn out to be one of the most recognisable world science events in the fields of medical and applied biological sciences. Since the very beginning, Prof. Primorac's efforts at organising these scientific conferences - which would somewhat later become the prominent ISABS conference series - have been joined by Prof. Moses Schanfield from George Washington

Evidencijski broj / Article ID: 17503836  
 Vrsta novine / Frequency: Kvartalna  
 Zemlja porijekla / Country of origin: Hrvatska  
 Rubrika / Section:



University and Stanimir Vuk Pavlović from Mayo Clinic, as well as by Prof. Šimun Anđelinović, today Rector of the University of Split, Prof. Henry Lee from New Haven University and Prof. Mitchell Holland from Penn State University. In 2013, the organisation of the clinical part of the programme was taken over by Prof. Tamas Ordog from Mayo Clinic, and the structuring of the programme in the fields of forensic and anthropologic sciences by Prof. Manfred Kayser from Erasmus University.

To date, the conferences organised by the International Society for Applied Biological Sciences (ISABS) have gathered over 4000 scientists and about 550 invited lecturers from a total of 70 countries. For 14 years, the clinical part of the programme of the conference has been organised by the leading US healthcare institution Mayo Clinic, whose strength is best evidenced by the fact that approximately 64,000 employees work at the Clinic, that its revenues exceed USD 10.3 billion, and that, according to the US News & World Report List 2016-2017, it was declared the best US hospital. This year's conference will be

attended by Vice President of Mayo Clinic, Prof. Gianrico Farrugia, whose lecture on translating the results of the basic medical sciences, particularly in the field of personalised medicine, into clinical practice will attract great attention. The organisation of ISABS conferences is also helped by a partner institution - the leading world forensic organisation, the American Academy of Forensic Sciences (AAFS), gathering over 7,000 forensic scientists from all over the world. During a recent annual academy, held in New Orleans in February 2017, AAFS declared ISABS an affiliated organisation, with AAFS having made such a decision only twice in its history.

#### The path to 22<sup>nd</sup> century medicine goes through Dubrovnik

Between 19 and 24 June, Croatia is becoming the centre of attention of world science, and the jubilee *Tenth ISABS Conference on Forensic and Anthropologic Genetics and Mayo Clinic Lectures in Individualized Medicine* [www.isabs.hr](http://www.isabs.hr) is gathering some

500 participants in Dubrovnik from about 40 countries from around the world. The Conference is organised by ISABS, Mayo Clinic and St. Catherine Special Hospital in collaboration with AAFS. The Conference's partner institution is Royal Philips, one of the leading corporations in the healthcare industry, the Croatian Medical Chamber and the Croatian Society of Human Genetics. The Conference will be held under the auspices of the Croatian Academy of Sciences and Arts. It is strongly supported by the Ministry of Tourism of the Republic of Croatia, the Ministry of Science and Education of the Republic of Croatia, Ministry of Health, the Croatian National Tourist Board, Croatian Chamber of Economy, PBZ, Croatia osiguranje, Tele 2, HEBE, d.o.o., Ballograf, Adriatic Luxury hotels, Dubrovnik museums, the City of Dubrovnik, the City of Zagreb, the City of Solin, Arona, Pliva, Belupo, Hrvatska elektroprivreda, Podravka, JANAF, Građa, ALPHACHROM, Jaguar, Landrover etc. The most fascinating topics in the field of individualised medicine, and forensic and



01 Prof. dr. Aaron Ciechanover, dobitnik Nobelove nagrade iz kemije 2004., prof. dr. Dragan Primorac i prof. dr. Robert Huber, dobitnik Nobelove nagrade iz kemije 1988.  
 Prof. Aaron Ciechanover, winner of the Nobel Prize for Chemistry in 2004, Prof. Dragan Primorac and Prof. Robert Huber, winner of the Nobel Prize for Chemistry in 1988

anthropologic genetics are dealt with by over 60 invited lecturers arriving from the most prestigious world scientific institutes, such as Mayo Clinic, the Harvard School of Medicine, the Technion - Israel Institute of Technology, the University of Cambridge, Duke University, the University of New Haven, the National Institutes of Health (NIH), Max Planck Institute, Thomas Jefferson University, Weizmann Institute of Science, George Washington University, Penn State University, Cleveland Clinic, etc. Besides leading world scientists, three Nobel Prize winners will also participate in the work of the Conference. Namely, Prof. Ada E. Yonath, Prof. Robert Huber and Prof. Harald zur Hausen. The results of their research have significantly contributed to the understanding of basic mechanisms in cell biology and the onset of disease. Prof. Ada E. Yonath was the first Israeli woman and the first woman from the Middle East to have been awarded a Nobel Prize, in the field of science, and the first woman in 45 years who has received the Nobel Prize for Chemistry. The focus of her research was ribosomes, cell structures that play a key role in translating RNA into proteins. Prof. Harald zur Hausen was awarded the Nobel Prize for his research on cervical cancer and the role of human papilloma virus (HPV) in the emergence of this disease, and Prof. Robert Huber was the first to

have crystallised transmembrane proteins, which is very important for photosynthesis in bacteria, having determined their structure at the same time.

During the work of The Tenth ISABS Conference on Forensic and Anthropologic Genetics and Mayo Clinic Lectures in Individualized Medicine, the joint section of ISABS and AAFS will be chaired by Susan Ballou, who is taking over presidency of the American Academy of Forensic Sciences in February next year. The central topic of this joint section is strategic collaboration between the American Academy of Forensic Sciences and ISABS, as well as the development of interstate collaboration of forensic experts in a fight against all types of crime. The Conference centres on personalised and regenerative medicine, cell and gene therapy, pharmacogenomics, molecular diagnostics, microbiome, and anthropologic and forensic genetics.

#### Personalised medicine

There is no doubt about personalised medicine being the path to medicine of the 22<sup>nd</sup> century. The right treatment to the right patient at the right time is the simplest definition of personalised medicine. It is based not only on our understanding of genome, protein and glycan analysis, but also our understanding of the impact of the environment on human health, all with a view to making an early diagnosis and deciding on an optimal treatment option. The power of personalised medicine is based on our understanding of processes at molecular level, and it ultimately enables the most precise treatment option through the concept of so-called precision medicine. Cell therapy and regenerative medicine have become an integral part of personalised medicine. Personalised medicine, which cell therapy and regenerative medicine belong to, has been gathering a momentum in recent years. The facts that the European Commission has established the International Consortium for Personalised Medicine (ICPerMed) and Croatia has established the Croatian Competitiveness Cluster for Personalised Medicine speaks volumes about the importance of personalised medicine.

Pharmacogenetics - whose aim is to identify changes within genes responsible

for drug metabolism in a timely fashion and to apply optimum therapy accordingly - is very often mentioned as one of the components of the concept of personalised medicine. Data published in the US journal JAMA warns that about 2,200,000 patients are hospitalised annually in the United States alone due to complications associated with taking medication, and that more than a hundred thousand die due to consequent complications. Preventing this is the goal of pharmacogenomics.

ISABS traditionally awards the world's best young scientists under the age of 40 with the Young Investigator Award. As of this year, in collaboration with the Croatian Education and Teacher Training Agency, ISABS is awarding, for the first time, the best works produced by Croatian high school students.

The papers must be in the field of human biology, genetics and chemistry. ISABS also awards all teachers-mentors of the winning students. The awarded high school students receive a certificate of attendance, their conference registration fee for all sessions covered, including the lectures given by the Nobel laureates, the opening ceremony, the gala dinner and hotel expenses free of charge.

- The best way to predict the future is to create it ourselves. This is why we are particularly pleased that our high school students, who are our future, are given an opportunity to meet Nobel Prize winners and some of the most prominent world scientists. This presents an opportunity for us to demonstrate once again that Croatia values excellence. Our country is beautiful, and many visitors from all over the world have already been convinced of this. But, we inherited our natural beauties, and so this is not our merit, while our share in science is. This Conference, bringing together the world's scientific elite, proves yet again that this really is so - said Prof. Dragan Primorac.

