



DELIBERA

Organo	COMITATO PER IL RECLUTAMENTO E LO SVILUPPO DELLE CARRIERE
Data seduta	7 novembre 2017 – riunione telematica
Sede	Via Calepina, 14 - Trento
Oggetto	Valutazione di ricercatore di cui all'art. 24, comma 3, lett. b), L. 240/2010 ai fini della chiamata nel ruolo di professore associato: dott. Martin Michael Hanczyc, Centro di Biologia Integrata.

Sono presenti alla deliberazione:

VALENTINA NIDER	Presidente	P
ALBERTO BELLIN	Componente	P
YURI BOZZI	Componente con funzioni di segretario	P
LUCA NOGLER	Componente	P
RAUL PAOLO SERAPIONI	Componente	P

P = presente; AG = assente giustificato; A = assente

Visto lo Statuto dell'Università degli Studi di Trento emanato con D.R. 167 del 23.04.2012;

Vista la legge 30 dicembre 2010 n. 240 "Norme in materia di organizzazione delle Università, di personale accademico e reclutamento, nonché delega al Governo per incentivare la qualità e l'efficienza del sistema universitario" e in particolare l'art. 24, comma 5;

Visto il Regolamento per il Reclutamento e la progressione di carriera di professori e ricercatori, emanato con D.R. n. 563 del 29 ottobre 2013 e in particolare l'art. 32 "Valutazione dei titolari dei contratti di cui all'art. 20, comma 1, lettera b) del presente Regolamento ai fini della chiamata nel ruolo di professore associato";

Visti i "Criteri per la valutazione dei ricercatori a tempo indeterminato con contratto di cui al comma 3, lettera b), dell'art. 24 della Legge 240/2010, ai fini della chiamata nel ruolo di professore associato", approvati dal Comitato per il Reclutamento e lo Sviluppo delle Carriere nella seduta del 21 luglio 2015;

Vista la delibera del Consiglio del Centro di Biologia Integrata del 16 maggio 2017, con la quale si esprime parere favorevole all'inquadramento del dott. **Martin Michael Hanczyc** nel ruolo di professore associato per il settore concorsuale 05/E1 (Biochimica generale);

Vista la propria delibera del 1° settembre 2017, con la quale sono stati individuati i referee esterni chiamati a valutare la maturità scientifica e didattica del dott. **Martin Michael Hanczyc** nel ruolo di professore associato per il settore concorsuale 05/E1 (Biochimica generale);

Viste le valutazioni espresse dai tre referee sul profilo del dott. **Martin Michael Hanczyc**, di cui sono riportati di seguito alcuni estratti:

Referee 1:

Recently I received the CV of Dr. Martin Michael Hanczyc Ph.D, under consideration for an associate professorship position in Biochemistry, at your Institution. Although not reported in his CV, Dr. Martin Michael Hanczyc received an Italian Abilitation for becoming an Associate Professor. I assume that in my role [...], I may simply support his eligibility after considering his CV. Dr. Martin Michael Hanczyc is an expert in interfacial dynamics, modeling of complex chemistry, optimization strategies, robot-chemistry interfaces, fundamentals of intelligent materials, synthetic biology, and new bio-inspired materials for architecture and engineering. Apparently, he established the Laboratory for Artificial Biology in 2014 as part of the Centre for Integrative Biology (CIBIO) at the University of Trento and this again is not mentioned in his CV; however traceable at his web site. According to SCOPUS, his is the author of some 42 publications with h-index equal to 16 and 1219 total citations. He is a brilliant young scientist, capable of fund raising and with international recognition in that area of physical-chemistry that, in my opinion, can be considered important for biochemical/biophysical foundations.

Referee 2:

Dr. Hanczyc has a strong background in synthetic biology, chemical evolution and membrane mechanics from his time in Yale University as a graduate student (1992-1999) and during his Post-Doctoral training with Nobel Laureate Prof. Jack Szostak at Harvard University (1999-2005). This was also a very productive time for Dr. Hanczyc where he produced some high impact and highly cited research articles. Since then, he has had an illustrious career internationally and he worked as faculty members or affiliate faculty member in UK, Denmark, Japan USA and Italy, establishing excellent international collaborations. Dr. Hanczyc is actively engaged in teaching undergraduate and graduate students and has been successful in receiving competitive funding from various agencies including NSF and NIH in the USA and Horizon2020 grants in the EU. Some of the recent work from Dr. Hanczyc has been focusing on biological computing, self-



assembly of vesicles, microbial biofuel, chemical evolution, and robotic symbiosis. These fields of research are closely aligned with research being carried out at CBIO and these research activities are at the forefront of future of science where there is convergence between chemistry, biology, material science, engineering and medicine.

I am not informed on the expected performance by faculty members to deserve promotion to the Associate Professor level at University of Trento, however, if I were to compare Dr. Hanczyc with other peer-institutions, I strongly feel that Dr. Hanczyc has matured in his research, has developed strong international collaboration, has demonstrated success in competitive funding and high quality publication to deserve promotion to Associate Professorship. At the same time, I would advice Dr. Hanczyc to build further collaboration across Europe to take advantage of H2020 and upcoming FP9 funding programmes which are essential to continue high-quality research and publications in this era. I feel that Dr. Hanczyc's field of research is still in its early days and it is becoming important in many different areas of basic science as well as applied fields. Researchers like Dr. Hanczyc are truly interdisciplinary and can bridge chemists, biologists, engineers and industries to develop next generation knowledge and products.

Referee 3:

[...] Dr. Hanczyc has established a unique research program that examines the physico-chemical properties, the significance to early life, and the technological applicability of vesicles and oil droplets in aqueous solutions. He has been an early arrival to this nascent research field as a co-author of several seminal articles (Science2003, J. Am. Chem. Soc 2007, 2009). Since then he remained a key figure contributing much to the integration of this field through his numerous scientific collaborations and through his high profile public outreach activities. His research output as evidenced by published and peer-reviewed articles can be roughly segmented into the following three sections. Models for early cell-like entities. Bilayer membranes formed from simple long chain fatty acids may have provided the first means for compartmentalization of the first self-replicating chemical systems that ultimately evolved into the first living entities. Dr. Hanczyc was among the first to address the tremendous importance of membranes for the emergence of life (Science2003, Orig. Life Evol. Biophys.2006, Phil. Trans. R. Soc. B2011, Life2014, Curr. Opin. Chem. Biol. 2017). Although his current research is less involved with recapturing events at the dawn of biology, he remains one of the preeminent experts in this field. At the University of Trento he co-authored a scholarly review (Curr. Opin. Chem. Biol. 2017) on the topic outlining the importance of chemical heterogeneity for membrane stability and evolutionary adaptability, the catalytic abilities of membrane surfaces which may have supported early metabolisms, and the intrinsic difficulties in examining realistic prebiotic mechanisms.

[...] Dr. Hanczyc co-authored two very influential articles in J. Am. Chem. Soc. on self-propelled oil droplets (both > 100 citations). Since then he has consolidated his leading position in this emerging field between chemistry and physics with peer-reviewed articles in Entropy (2011), ChemPlusChem (2013), Artificial Life (2013), and Langmuir (2014, 2016). His recent work in Trento on the "Dynamics of Chemotactic Droplets" (Langmuir2014) describes a simple two-phase system exhibiting forces acting on droplets during motion support the hypothesis that gradients of the surface tension could provide the driving force for the observed mobility. This mechanism is fundamentally different from that described from the chemotactic behavior of living cells. This insightful observation indicates that

"chemotaxis" may be a poor metaphor for the dynamic behavior of droplets.

In a follow-up article (Langmuir2016) Dr. Hanczyc describes the shape shifting properties of decanol droplets in evaporating aqueous solutions of sodium decanoate. The authors discovered conditions that shape these droplets to tentacular structures. The finding that these very simple systems lead to complex but predictable structures is remarkable. This behavior is hardly a new phenomenon (as claimed), but the authors may have a point that detailed analysis of this behavior – including mathematical modeling may reveal much needed insight into the laws of morphogenesis on the micro- to millimeter scale. Dr. Hanczyc has indeed identified a fruitful field for academic research. However, it is important that the merely descriptive nature of the published research would be complemented with more rigorous and quantitative analysis in the future.

[...] A third project in Dr. Hanczyc's lab examines the possibility to assemble complex soft matter based on droplets and giant unilamellar vesicles. In a series of articles Dr. Hanczyc (PLoS ONE2012, PNAS2013, Langmuir2016) has demonstrated that droplets and vesicles can be used as building blocks for tunable and controllable materials. In his latest work in Trento (Langmuir2016) he showed that supramolecular chemistry could be used to integrate vesicles and droplets into reversible aggregates. This development paves the avenue for combining self-propelled droplets with cargo-carrying vesicles as a blueprint for programmable and directional chemical transport over near-macroscopic distances. This research is obviously far from direct application, but the novelty of the field holds much

promise for future developments. However, concrete perspectives for how programmable vesicle transport could be put to technological use would certainly strengthen this research field.

[...] Since 2014 Dr. Hanczyc has raised about 600 K EUR, which is remarkable given the fundamental nature of his research.

[...] Based on the provided information I cannot directly assess the quality of Dr. Hanczyc's teaching, nor have I any information about the student satisfaction. Nevertheless, in view of the long list of courses and invited lectures, and after viewing youtube videos of public lectures (including a TED talk) given by Dr. Hanczyc, I



arrive at the conclusion that he is an effective teacher, and an excellent public communicator.

In conclusion, Dr. Hanczyc has established himself as a well-connected and creative protagonist in a research field with much future potential. He has demonstrated the ability to support his research by external grants and he has shown many times his outstanding ability to communicate scientific content. In my opinion, he demonstrated excellence in primary research, fund raising and teaching. Since these are the key tasks of an academic researcher, I can certainly recommend Dr. Hanczyc for promotion to tenured Associate Professor;

Visto il *curriculum vitae* del dott. **Martin Michael Hanczyc**;

Con voto unanime;

Delibera

1. di formulare la seguente valutazione del dott. **Martin Michael Hanczyc**, ai fini della chiamata ai sensi dell'art. 24 comma 5, L. 240/2010 nel ruolo di professore associato per il settore concorsuale 05/E1 (Biochimica generale):

*I giudizi espressi dai referee esterni sul contributo scientifico, la qualità dell'attività di ricerca e l'esperienza professionale del dott. **Martin Michael Hanczyc**, nonché sulla coerenza del suo profilo con i requisiti attesi per il ruolo di professore di seconda fascia, sono positivi.*

*A seguito di attenta valutazione del curriculum e delle pubblicazioni, e sulla base dei giudizi formulati dai referee, il Comitato ritiene il profilo scientifico del candidato pienamente adeguato al ruolo ed esprime parere favorevole alla chiamata del dott. **Martin Michael Hanczyc** nel ruolo di professore associato per il settore concorsuale 05/E1 (Biochimica generale).*

F.to Il Presidente
Prof.ssa Valentina Nider

F.to Il Segretario
Prof. Yuri Bozzi