

March 11, 2022

**Assessment of David LUKÁŠ accomplishments
as a professor in the field of Biophysics**

To Whom It May Concern,

It is my great pleasure to provide this assessment for Prof. RNDr. David LUKÁŠ, Ph.D., who is applying for the promotion to a professor at the Palacký University of Olomouc (UPOL). In the interests of full disclosure, I would like to note that Prof. Lukáš and I have been collaborating for the last ten years on the International Research Experience for Students (IRES) project. This project focuses on a collaborative research and student training in advanced nanofibrous materials for bio-medical and other applications, understanding of physics of the nanofiber fabrication processes, and properties of nanofibrous biomaterials. Prof. Lukáš has hosted and mentored more than forty undergraduate and graduate students from my home institution. Seven graduate students from Prof. Lukáš's group have conducted research in my laboratory at the University of Alabama at Birmingham (UAB).

Introduction of the assessment author

I am a full professor with the Department of Physics at UAB. My background is electrical engineering (BS/MS) and condensed matter physics (PhD), and I have been involved in research in the transdisciplinary areas of physics of nanomaterials, nanofabrication and nanostructures for bio-medical, catalytic, energy, and environmental applications for over 35 years. I have more than 120 peer-reviewed scientific publications (h-index 29, 4081 citations) in the international scientific journals and conference proceedings, 4 book chapters, 3 patents and over 220 invited and contributed presentations at various conferences and symposia. Approximately 23% of my publications and presentations have been in bio-medical and biophysics fields. I have also served as a panelist for NIH National Institute of Biomedical Imaging and Bioengineering (NIBIB) and multiple programs at the U.S. National Science Foundation (NSF). I have sufficient expertise in the pertinent areas to provide professional and unbiased evaluation of Prof. Lukáš's scholarship activity and accomplishments in the field Biophysics.

Perspective of my insight into the work being considered

Our collaboration with Prof. Lukáš has been established in 2013 through my NSF funded IRES project on nanofibers and nanofibrous materials science and technology. The selection of this research topic was based on the innovative work of Prof. Lukaš on novel electrospinning methods and approaches in fabrication and application of nanofiber-based materials. To the date, forty UAB students have visited and worked in the labs of Prof. Lukáš's group at Technical University of Liberec (TUL). Each such visit was about two months long and students were dealing with various methods, especially with novel alternating current (AC) electrospinning technique, to prepare nanofibrous materials and analyze such materials, in part, in physiological environment. The

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prospects of AC electrospinning are enormous in terms of fundamental science of this process and scalability for sustainable production of nanomaterials, and their commercial potential. There are big difficulties in training students for this very transdisciplinary research area, and I highly value Prof. Lukáš's huge effort in training UAB students for collaborative international research with Czech and other EU institutions, and globally afterwards. Most of former IRES undergraduate trainees have entered strong graduate schools, and many students obtained prestigious awards and fellowships.

Accomplishments as a scholar and the candidate's potential for future excellence in the field

Prof. Lukáš training in the field of biophysics enables him to look into the challenging problems of the nanofibers synthesis methods and nanofibrous material properties from highly unusual angles. Prof. Lukáš's expertise goes beyond traditional biophysics methods and allows him to develop fresh ideas in the field. This was one of the main reasons for our fruitful collaboration that led to the date to eight joint research papers published in prominent journals (e.g., *Ceramics International*, *RSC Advances*, *Scientific Reports*, *Journal of Applied Polymer Science*) that are well-ranked in the relevant fields. We work currently on several collaborative papers and plan a substantial number of future publications through our ongoing research activities. In my opinion, Prof. Lukáš has made very large contributions in the area of nanofibrous materials for bio-medical applications as well as, through our collaboration, to the area of ceramic- and carbon-based nanofibrous materials. His research has been focused, in part, on complex electrohydrodynamic instabilities occurring during the processes of nanofibers formation and their effect on the nanofibrous materials textural properties and application as scaffolds in tissue engineering. Prof. Lukáš clearly made very strong progress in this area as evident from his multiple papers and funded projects, and his contributions are recognized through numerous citations (e.g., see a list of some highly cited Prof. Lukáš's recent papers [1-4] in the notes below). It is obvious to me that he has much more to offer in his new role in the area of biophysics. In my opinion, he is one of a very few scientists who have developed as internationally recognized leaders in this area.

1. Sivan, M., Madheswaran, D., Asadian, M., Cools, P., Thukkaram, M., Van Der Voort, P., Morent, R., De Geyter, N., Lukas, D., Plasma treatment effects on bulk properties of polycaprolactone nanofibrous mats fabricated by uncommon AC electrospinning: A comparative study, (2020) *Surf. Coat. Technol.* 399, Art.#126203. Cited 13 times.
2. Valtera, J., Kalous, T., Pokorny, P., Batka, O., Bilek, M., Chvojka, J., Mikes, P., Kostakova, E.K., Zabka, P., Ornstova, J., Beran, J., Stanishevsky, A., Lukas, D., Fabrication of dual-functional composite yarns with a nanofibrous envelope using high throughput AC needleless and collectorless electrospinning, (2019) *Sci. Rep.*, 9, Art.#1801. Cited 32 times.
3. Horakova, J., Mikes, P., Saman, A., Jencova, V., Klapstova, A., Svarcova, T., Ackermann, M., Novotny, V., Suchy, T., Lukas, D., The effect of ethylene oxide sterilization on electrospun vascular grafts made from biodegradable polyesters, (2018) *Mater. Sci. Eng.C*, 92, 132-142. Cited 34 times
4. Rampichová, M., Chvojka, J., Jenčová, V., Kubíková, T., Tonar, Z., Erben, J., Buzgo, M., Daňková, J., Litvinec, A., Vocetková, K., Plencner, M., Prosecká, E., Sovková, V., Lukášová, V., Králíčková, M., Lukáš, D., Amler, E. The combination of nanofibrous and microfibrillar materials for enhancement of cell infiltration and *in vivo* bone tissue formation, (2018) *Biomed. Mater. (Bristol)* 13, Art.#025004. Cited 31 times.

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Comment on elements of the candidate's teaching

Although I was unable to observe in person Prof. Lukáš's classroom teaching, my IRES students have taken Prof. Lukáš's classes and seminars during their visits to TUL. From IRES students' very positive comments, I can judge that Prof. Lukáš has shown high creativity and initiative in developing the class content and explaining it clearly to students. Already at the stage of pre-trip training of our IRES students each year since 2013, Dr. Lukáš devoted a lot of his time to speed up all administrative requirements including students' accommodation. Upon students' arrival to TUL, he immediately introduced them to his team and the work environment/labs where they were working for another two months. He familiarized them with the university and the city of Liberec, and helped them to incorporate into the student social life and cared about their extracurricular activities. As a scholar and university lecturer, Prof. Lukáš has been always welcoming and open, but as the leader he is strict and consistent. Every week, IRES students had to prepare the progress reports of their projects and those were presented at the seminars. Despite the large variety of IRES student projects, Prof. Lukáš was able to provide valuable and expert advice and comments on each subject. Furthermore, during his visit to UAB in 2018, Prof. Lukáš has delivered a powerful seminar to our physics graduate students that generated a lot of interest and numerous questions. According to students' ranking, the seminar was one of two best seminars given in that semester.

I am confident Prof. Lukáš would be hired as a professor of Biophysics in a prestigious Czech or other EU university if he would wish to apply there. I also strongly believe he would be considered a perfectly viable full professor candidate at UAB or at other comparable U.S. institutions. He is a certainly an asset to his department, university and international collaborators. For the reasons given above, I am convinced that Dr. Lukáš is highly qualified for the proposed promotion to the rank of professor of Biophysics at the Palacký University of Olomouc, and I recommend him for that position without any reservation. Should you need further information, please feel free to contact me.

Sincerely yours,

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