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January 14, 2010

Faculty Appointments and Advancement
Academic Affairs / Dean of Faculties
Indiana University Purdue University Indianapolis
Administration Building, Suite 126
355 North Lansing Street
Indianapolis, IN 46202-2896

RE: Nomination of Dr. Susan J. Gunst for Chancellor's Professorship

Dear Selection Committee:

I am writing to give my strongest support for the nomination of Dr. Susan Gunst for a Chancellor's Professorship at IUPUI. I enthusiastically and unreservedly concur with Dr. Sturek's letter of support for Dr. Gunst.

Dr. Sturek has thoroughly summarized Dr. Gunst's outstanding contributions to teaching, service and mentoring at IUPUI. I will concentrate on evaluating Dr. Gunst's research contributions and the impact of her work on the fields of airway smooth muscle and smooth muscle mechanotransduction.

Dr. Gunst is well funded by NIH and has been continuously funded by that agency for over 23 years. I cannot overemphasize how difficult and rare it is to achieve this type of funding record. The fact that both of her NIH grants were recently renewed, and that her longest-standing grant was renewed on its first submission, is very strong evidence of the degree to which her innovation and productivity is appreciated by her scientific peers.

Clearly, Dr. Gunst is a leader in her field and has an outstanding national and international reputation. Remarkably, her high level of research productivity has been maintained while she has served as a regular member on multiple NIH Study Sections, as Associate Editor for the Journal of Applied Physiology, and as the Chair of multiple committees for the American Physiological Society and the American Thoracic Society. This also is an unusual level of national service for someone who devotes ~80% effort to research.

I would like to illustrate how Dr. Gunst's work has impacted my own work, even though my expertise is in the area of vascular mechanotransduction. Even though I have never worked on airway smooth muscle, I appreciated many years ago that some of Dr. Gunst's publications on the length and contraction history of airway smooth muscle were novel contributions to our understanding of all types of smooth muscle. Three particular papers that impacted me were:

- Gunst, S.J. Effect of length history of contractile behavior of canine tracheal smooth muscle. Am. J. Physiol.: 250 (Cell Physiol. 19):C146-C154, 1986.

- Gunst, S.J., Wu, M.-F. and Smith, D.D. Contraction history modulates isotonic shortening velocity in smooth muscle. Am. J. Physiol.(Cell Physiol. 34):C467-C476, 1993.
- Mehta, D, MF Wu, SJ Gunst. Role of contractile protein activation in the length-dependent modulation of tracheal smooth muscle force. Am. J. Physiol. 270 (Cell Physiol. 39): C243-C252, 1996.

About 10 years ago, Dr. Gunst's work on contractile proteins resulted in the following paper, which led her in a new direction.

- Tang, D., Mehta, D, and SJ Gunst. Mechanosensitive tyrosine phosphorylation of paxillin and focal adhesion kinase in tracheal smooth muscle. Am. J. Physiol.. 276: (Cell Physiol. 45): C250-C258, 1999.

At about the same time, my laboratory had also begun pursuing similar studies, albeit in vascular smooth muscle. The paper by Tang et al. made a substantial impact on my work and on the smooth muscle field, as evident from the number of invitations she subsequently received to present her work at national and international symposia. I have personally chaired two symposia in which she has participated and both times she gave the best presentation of the session.

Shortly after the publication above, and after two other papers that she published around the same time, Dr. Gunst invested considerable effort into incorporating molecular biological methods into her classical training in physiology and muscle mechanics. Importantly, she devised methods to manipulate protein expression in intact airway smooth muscle so that mechanical measurements of muscle performance could be made to evaluate the functional consequences of changing these proteins. I cannot emphasize strongly enough how difficult it is to do this. It is a very needed alternative to transgenic mouse approaches, if for no other reason than it provides a check on how an animal might compensate in unpredictable ways to gene manipulation. Three particular studies stand out in this regard:

- Tang DD. Gunst SJ. Depletion of focal adhesion kinase by antisense depresses contractile activation of smooth muscle. Am. J Physiol. Cell Physiol. 280(4):C874-83, 2001.
- Tang, DD, CE Turner, SJ Gunst. Expression of non-phosphorylatable paxillin mutants in smooth muscle inhibits tension development. J. Physiol. 553:21-35, 2003.
- Opazo Saez, A, DD Tang, WW Zhang, Y Wu, CE Turner, and SJ Gunst. Tension development during contractile stimulation of smooth muscle requires recruitment of paxillin and vinculin to the membrane. Am. J Physiol. Cell Physiol. 286: C433-47, 2004.

Since these initial studies, Dr. Gunst has published at least 14 significant papers related to the assembly and reorganization of the smooth muscle cytoskeleton / cell adhesion complexes caused by mechanical forces. These include the following notable contributions:

- Tang, DD and SJ Gunst. The Small GTPase Cdc42 Regulates Actin Polymerization and Tension Development during Contractile Stimulation of Smooth Muscle. J Biol. Chem. 279(50):51722-8, 2004.
- Zhang W, Y Wu, L Du, DD Tang, and SJ Gunst. Activation of the Arp2/3 Complex by N-wasp is Required for Actin Polymerization and Contraction in Canine Tracheal Smooth Muscle. Am. J Physiol. Cell Physiol. 288(5):C1145-60. 2005.
- Zhang, W and SJ Gunst. Dynamic association between α-actinin and β-integrin regulates contraction of canine tracheal smooth muscle. J Physiol. 572.3: 659-676, 2006.

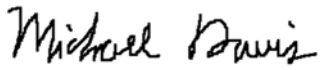
- Zhang W, Wu Y, Wu C, SJ Gunst. Integrin-linked Kinase (ILK) regulates N-WASp-mediated actin polymerization and tension development in tracheal smooth muscle. J Biol. Chem. 282(47):34568-80, 2007.
- Gunst SJ and Zhang W. Actin cytoskeletal dynamics in smooth muscle: A new paradigm for the regulation of smooth muscle contraction. Am. J Physiol. Cell Physiol. 295(3):C576-87, 2008.

As is characteristic of all her work, these more recent publications are consistently outstanding and of the highest quality. They continue to influence my thinking and the work of many other laboratories around the world. Indeed, I am not exaggerating by stating that the impact of Dr. Gunst's publications has risen even more over the past 10 years. This conclusion is supported by her recent publications in non-physiology journals such as the Journal of Biological Chemistry and by her membership in the American Society for Cell Biology.

Finally, I would also like to echo Dr. Sturek's highly positive comments about Dr. Gunst's collegiality. It is not uncommon to find colleagues with Dr. Gunst's research stature to be arrogant, unapproachable, and uncooperative. None of these terms can be applied in any way to Susan! I have visited IUPUI twice in the last 10 years in addition to hosting Susan for a seminar visit at my former institution, Texas A&M University. All my interactions with her have been 100% positive as have all the comments about her from other colleagues when she visited Texas and during my visits to IUPUI. She is an outstanding model of collegiality.

I could not recommend anyone more highly for this distinguished award.

Sincerely,



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