

**BIOGRAPHICAL SKETCH**

|                                    |                                    |                                       |                   |
|------------------------------------|------------------------------------|---------------------------------------|-------------------|
| NAME<br>Alan Monte Jones           |                                    | POSITION TITLE                        |                   |
| eRA COMMONS USER NAME<br>ALANJONES |                                    | Professor of Biology and Pharmacology |                   |
| EDUCATION/TRAINING                 |                                    |                                       |                   |
| INSTITUTION AND LOCATION           | DEGREE                             | YEAR(s)                               | FIELD OF STUDY    |
| Univ. of Wisconsin, Madison        | Postdoc                            | 1983-86                               | Protein Structure |
| University of Illinois Urbana      | Ph.D                               | 1983                                  | Plant Biology     |
| University of Florida, Gainesville | B.S.<br><i>summa<br/>cum laude</i> | 1978                                  | Botany            |

**A. Personal Statement**

My expertise is signal transduction with emphasis on plant cells. I introduced the genetic model *Arabidopsis* to the G protein field in 2001 with two high impact papers showing the role of G signaling within a biological context (*Science* **292**:2066 and *Science* **292**:2070). Remarkably, even after 30 years of G protein research by the time those two papers were published, all G protein research had been done with cells (on plastic) or yeast; there was no good multicellular context to place the function of G proteins. The knock-out mouse was not yet routine by 2001 therefore my rationalization was to use *Arabidopsis*, particularly since the G protein repertoire was vastly simpler than in the mouse. Two major discoveries came soon after. We discovered that plants had a self-activating G protein (*PNAS* **104**:17317) and a receptor RGS (*Science* **301**: 1728).

**B. Positions and Honors.****Positions and Employment**

2013- Kenan Distinguished Professor (permanent title)  
 2005-2010 George and Alice Welsh Distinguished Professor (termed title)  
 2004- Professor of Pharmacology, University of North Carolina- Chapel Hill  
 1999- Professor of Biology, Univ. North Carolina-Chapel Hill  
 1992-1999, Associate Professor of Biology, Univ. of North Carolina-Chapel Hill  
 1986-1992 Assistant Professor of Biology, Univ. of North Carolina-Chapel Hill

**Other Experience and Professional Memberships**

2013-2015 President, American Society of Plant Biologists  
 2010- Editor *Current Opinion in Plant Sciences*  
 2001/10 USDA Nat'l Institute Food and Agriculture, Panel Manager  
 1991-1993 USDA NRICGO, panel member  
 2007-2010 Executive Committee, Amer. Soc. Plant Biologists (elected)  
 2005-2012 Associate Editor, *Plant Physiology*  
 2004-2007 NIH Study Section, Immunology Fellowships, permanent  
 2003- 2005 DOE Bioscience Program, panel member  
 2002- NSF, Cell Biology Signal Transduction, regular member  
 2002- NIH study section member, SSS-Y (SBIR), permanent  
 2001 USDA NRICGO, Panel Manager  
 1999 NIH Study Section, Molecular Biology, CDF-1  
 1991-1998; editorial board, *Plant Physiology*  
 1997- 2000 Faculty member in Program in Cell Biology  
 1991-1996, Faculty member in the Program for Protein Engineering and Molecular Biology

## **Honors**

2013 AAAS Fellow

2010 Elected Full Fellow of Sigma Xi

2009 Fellow of the American Society of Plant Biologists

1996-Alexander von Humboldt Research Fellow

## **C. Contributions to Science.**

**1. Past Contributions.** As a graduate student, I developed the first photoaffinity probe used for a plant application. With this probe, I provided direct evidence for the identity of the first auxin receptor (i, ii). As a postdoc, I determined the structure of the photoreceptor protein phytochrome A (iii). This involved development of a protein complementation technique prior to the invention of yeast two hybrid (iv). As a faculty member at the University of North Carolina, I have worked in three areas: auxin receptors (v-vii), programmed cell death, and heterotrimeric G protein signaling. I introduced the idea and coined the term “functional corpse” and my work introduced the importance of the vacuole in customized cell death (viii). I was among the first (3<sup>rd</sup> to publish) to use a reverse genetic approach to delineate the function of a plant gene (ix). I elucidated the mechanism for activation of the heterotrimeric G protein in plants and protists, showing that this mechanism operates oppositely to the mechanism in animal cells (x-xiii). At this point, I have authored over 180 peer-reviewed publications.

- i. Jones, A.M., L.L. Melhado, T.-H.D. Ho, C.J. Pearce, and N.J. Leonard (1984) Azido Auxins: Photoaffinity labeling of auxin-binding proteins in maize coleoptile with tritiated 5-azidoindole-3- acetic acid. *Plant Physiol* **75**:1111-1116. PMC1067062
- ii. Jones, A.M., M.A. Venis (1989) Photoaffinity labeling of auxin-binding proteins in maize. *Proc. Natl. Acad. Sci. USA* **86**:6153-6156 PMC297795
- iii. Jones, A.M. and P.H.Quail (1986) Quaternary structure of 124-kilodalton phytochrome from *Avena sativa* L. *Biochemistry* **25**:2987- 2995.
- iv. Edgerton, M.E. and A.M. Jones (1992) Localization of protein-protein interaction between the subunits of phytochrome. *Plant Cell* **4**:161-171 PMC160117
- v. Brown, J. C. and Jones, A. M. (1994) Mapping the auxin-binding site of auxin-binding protein 1. *J. Biol. Chem.* **269**: 21136-21140 PMID 8063734
- vi. Tian, H., Klamt, D. and Jones, A.M. (1995) Auxin-binding protein 1 does not bind auxin within the endoplasmic reticulum despite this being the predominant subcellular location for this hormone receptor. *J. Biol. Chem.* **270**:26962-26969 PMID 7592943
- vii. Jones, A. M. , Im, K-H., Savka, M., Wu, M-J., DeWitt, N.G., Shillito, R. Binns, A. (1998) Auxin-dependent cell expansion mediated by overexpressed auxin-binding protein 1. *Science* **282**: 1114-1117 PMID 9804548
- viii. Groover, A., Jones, A.M. (1999) Tracheary element differentiation uses a novel mechanism coordinating programmed cell death and secondary cell wall synthesis. *Plant Physiology* **119**:375-384 PMC32113.
- ix. Chen, J, Ullah, H., Young, J.C., Sussman, M.R., Jones, A.M (2001) ABP1 is required for organized cell elongation and division in *Arabidopsis* embryogenesis. *Genes and Development* **15**:902-911
- x. Ullah, H. Chen, J. G., Young, J., Im, K-H., Sussman, MR., Jones, AM (2001) Modulation of cell proliferation by heterotrimeric G-protein in *Arabidopsis*. *Science* **292**: 2066-2069 PMID: 11408655
- xi. Wang, X-Q., Ullah, H., Jones, A.M., Assmann, SM (2001) G-protein regulation of ion channels and abscisic acid signaling in *Arabidopsis* guard cells *Science* **292**: 2070-2072 PMID: 11408654
- xii. Chen, Jin-Gui, Willard, F.S., Huang, J., Liang, J., Chasse, S.A.,\*Jones, A. M.,Siderovski, D.P. (2003) A seven-transmembrane RGS protein that modulates plant cell proliferation. *Science* **301**: 1728-1731 \*corresponding senior author PMID: 14500984
- xiii. Urano, D., Phan, N., Jones, JC, Yang, J., Huang, J., Grigston, J., Taylor, JP., Jones, AM (2012) Endocytosis of seven-transmembrane RGS protein activates G-coupled signaling in *Arabidopsis*. *Nature Cell Biology* **14**: 1079-1088 PMC3463750

- xiv. Fu, Y, Lim, S, Urano, D, Phan, NG, Elston, TC, Jones, AM Reciprocal encoding of signal intensity and duration in the glucose-sensing circuit *Cell* **156**: 1084-1095 PMC4364031
2. Current research contributions to science. Our systems modeling and biochemical validation is revealing new leads into how non-animal cells discriminate signals and previously-unknown means to activate the G protein pathway (xv). The system architecture imparts properties that were not anticipated such as noise filters and edge detectors (xvi). Another active area I am taking my research is unraveling the interconnection of trafficking with signaling (xvi) My work is becoming more translational; previous work showed that G proteins control important agronomic traits that I am now engineering in rice.
- xv. Tunc-Ozdemir, M, Urano, D, McCarter, P, Jaiswal, D, Clouse, SD, Elston, T, Jones, AM Direct Activation of a Heterotrimeric G protein by a Receptor Kinase Complex *Mol Cell* (under review)
- xvi. Phan, N, Urano, D, LeDonne, S, Fu, Y, Yang, J, Wu, L, Trusov, Y, Botella, JR, Elston, T Jones, AM A surface complex for extracellular glucose perception has an endosomal origin for signaling.(under revision)
3. Contributions to training and mentorship. I have mentored 38 postdoctoral associates, 8 graduate students, and about 150 undergraduate researchers. Some examples of their current career positions are noted below. I have mentored several junior faculty (not listed).

Some Former Postdocs:

Dr. Daisuke Urano, 2010- 2015, Assistant Professor Temasek Natl Univ Singapore  
Dr. Tyrell Carr, 2007- 2010, Assoc. Professor, Chowan University  
Dr. Jeff Grigston, 2006-2007 AEI Head science editor  
Dr. Jan Jones 2005- 2011, Scientist, AgBiome  
Dr. Yashmanti Mudgil 2005- 2010, Assoc. Professor Univ Delhi  
Dr. Phil Taylor 2004-2006, Senior Scientist, Regulatory Division, Monsanto St. Louis  
Dr. Pat Morgan 2004-2006 Head of Research and Development, LiCor Instruments  
Dr. Zhongyin Chen 2004-2007 Senior Scientist, Syngenta  
Dr. Jirong Huang 2002-2004 Professor, Shanghai Inst. Plant Physiology  
Dr. Jin-Gui Chen, 1998-2004, Senior Scientist, Oakridge National Laboratory

Some Former Graduate Students:

Dr. Erin Friedman, Ph.D 2005-2011, currently Asst Prof Lynchburg College  
Dr. Hemayet Ullah, Ph.D. 1998- 2002 currently Prof at Howard University  
Dr. Andrew Groover, Ph.D. 1993-1997 currently Prof. Univ. California, Davis, and Division Chief, Forest Genetics Lab, United States Department of the Interior  
Dr. Mike Edgerton, Ph.D. 1987-1992 currently Director of Genetics, Monsanto, St. Louis

**Near complete list of published works:**

<http://www.ncbi.nlm.nih.gov/sites/myncbi/1RKJR7xj5gjQt/bibliography/49061196/public/?sort=date&direction=ascending>.

**ACTIVE GRANTS**

MCB -1158054 2012-2016  
NSF MCB no cost extension  
**G Protein Activation through Uncoupling Regulator of G Signaling Protein, AtRGS1.**

DE-FG02-05ER15671 1/1/15-12/31/17  
DOE: Div. of Energy Bioscience \$300,000  
**G Protein Regulation of Energy Perception, Conversion, and Storage**

R01 GM111474 09/01/2014 – 8/31/18  
NIH/NIGMS \$1,200,000  
**Novel Mechanisms Regulating the Heterotrimeric G Protein Complex (renewal)**

GRANT11888512 12/1/15-11/30/18  
AFRI (Natl Inst Food & Agriculture) \$400,000  
**Control of Rice Growth and Stress Tolerance by Activation of the Heterotrimeric G Protein Complex**