

BIOGRAPHICAL SKETCH

NAME Alan Monte Jones	POSITION TITLE		
eRA COMMONS USER NAME ALANJONES	Professor of Biology and Pharmacology		
EDUCATION/TRAINING			
INSTITUTION AND LOCATION	DEGREE	YEAR(s)	FIELD OF STUDY
Univ. of Wisconsin, Madison University of Illinois Urbana	Postdoc Ph.D	1983-86 1983	Protein Structure Plant Biology
University of Florida, Gainesville	B.S. <i>summa 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 (3rd 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., Klammt, 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

Principal Investigator/Program Director (Last, First, Middle): Jones, Alan, Monte

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