

CURRICULUM VITAE

Academic address	<p>Gro V. Amdam School of Life Sciences Arizona State University Tempe, AZ 85287, USA Phone: (480) 956-5365 Fax: (480) 965-6899 E-mail: Gro.Amdam@asu.edu</p>	<p>Dept. of Chemistry, Biotechnology and Food Science Norwegian University of Life Sciences Post Office Box 5003 Aas, N-1432, Norway E-mail: gro.amdam@umb.no</p>
Personal information	<p>Norwegian Citizen US Visa: H1-B</p>	
Education	<p>1997: Bachelor of Science, Conservation Biology, Norwegian University of Life Sciences 1999: Master of Science, Theoretical Regulatory Biology, Norwegian University of Life Sciences 2003: Doctor scientiarum, Theoretical Regulatory Biology, Norwegian University of Life Sciences</p>	
Appointments	<p>1999- 2000: Lecturer, Gjermundnes Agricultural College, Vikebukt, Norway 2003: Associate professor (term appointment), Department of Animal Science, Norwegian University of Life Sciences 2003- 2005: Visiting researcher, University of California, Davis 2005- 2007: Assistant professor (tenure-track), School of Life Sciences, Arizona State University 2005- 2008: Associate professor-II (20 % term appointment), Department of Animal and Aquacultural Sciences, Norwegian University of Life Sciences 2007- present: Associate professor, School of Life Sciences, Arizona State University 2008- present: Associate professor-II (20 % term appointment), Department of Chemistry, Biotechnology and Food Science, Norwegian University of Life Sciences</p>	
Professional activities	<p>Member: Social Insect Research Group Arizona State University; Center for Social Dynamics and Complexity at Arizona State University; Santa Fe Institute for Complex Studies' Systems Biology & Social Insect Group. Consultant: BeeSpace (www.beespace.uiuc.edu).</p> <p>Manuscript reviews: <i>AGE, Analytical and Bioanalytical Chemistry, Apidologie, Archives of Insect Biochemistry and Physiology, Behavioral Ecology and Sociobiology, BioTechniques, BMC Biotechnology, Current Biology, Genetics, Insectes Sociaux, Journal of Experimental Biology, Journal of Insect Physiology, Journal of Theoretical Biology, Molecular Ecology, Nature, Naturwissenschaften, PLoS Biology, Proceedings of the National Academy of Science USA, Proceedings of the Royal Society, Proteomics, Reproductive Biology and Endocrinology</i></p> <p>Grant reviews: Ad hoc reviewer <i>National Science Foundation</i>.</p>	

**Competitive
funding: awarded***National Science Foundation:*

2006-2008: Proposal #0615502, \$365,000.00 – “Genetic dissection of the reproductive ground-plan hypothesis of social evolution” (Co-PI, 60% of award)

Research Council of Norway (awards with ASU subcontracts are indicated):*

2000-2004: NFR #133680/110, \$390,000.00 – “Regulatory anatomy of honey bee lifespan”. Personal Dr. fellowship, supervised by Dr. Stig W. Omholt

2003-2005: NFR #157851/432, \$270,000.00 – “Application of RNA interference technology for understanding somatic maintenance functions in the honeybee (*Apis mellifera*)” (PI)

2003-2006: NFR #147085/i10, \$310,000.00 – “Visualization of vitellogenin dynamics and associated physiology in the honey bee (*Apis mellifera*)” (PI)

2004: NFR #157851/V40, \$25,000.00 – USA overseas research fellowship (PI)

2006-2008: NFR #171958, \$315,000.00 – “Dissecting the physiological, sensory, cognitive, and social dynamic features of cellular aging in the honey bee worker brain” (PI)*

2007-2010: NFR/FUGE #175413, \$1,200,000.00 – “A study of aging in the honey bee brain” (PI)*

2007-2011: NFR #ES419969, \$1,600,000.00 – “Genetic dissection of the reproductive ground-plan hypothesis of social evolution: Young Outstanding Researchers Program (YFF)”(PI)*

2008-2011: NFR #186362, \$750,000.00 – “Dissecting molecular properties of honey bee vitellogenin (Vg): a protein acting at the intersection between social behavior and aging” (PI)*

2008-2011: NFR #185306, \$690,000.00 – “Exploiting plasticity in a social life history: understanding physiology of extreme longevity using honey bee *diutinus* workers” (Co-PI)

**Competitive
funding: pending***National Science Foundation:*

2008-2010: Proposal #0641057, \$398,000.00 – “Role of heterochronous expression of reproductive traits in the evolution of eusociality (PI)

2008-2010: Proposal #0744452, \$590,160.00 – “Collaborative Research: Testing Mechanisms of a Diapause Pathway as the Gateway to Castes in a Social Insect” (PI)

2008-2010: Proposal #0719532, \$403,000.00 – “Physiological mechanisms regulating division of labor in social insects: an intercaste and interspecific comparison in ants (Co-PI)

2008-2010: Proposal #0744707, \$464,832.00 – “How genotype, ovaries, and hormonal signals regulate division of labor and foraging specialization in the honey bee (*Apis mellifera* L.)” (Co-PI)

2008-2010: Proposal #0742795, \$639,788.00 – “Epistasis and a theory of social insect Evo Devo” (Co-PI)

National Institute of Health

2008-2012: PO, \$1,000,000.00 – “Biodemography of Aging” (Co-PI)

Awards*Arizona State University*

2006: selected as the one applicant from Arizona State University for the 2007 PEW Scholarship

Awards in the Biomedical Sciences

The PEW Charitable Trust

2007: PEW Scholarship Award in the Biomedical Sciences, \$240,000.00

Norwegian University of Life Sciences:

2006: Nominated – Dept. of Animal and Aquacultural Sciences award for excellence in research

Research Council of Norway

2007: Fellow –Young Outstanding Researchers Program

Student and postdoc honors

2006: Kate Ihle, 2nd price – poster competition, IUSSI

2006: Kate Ihle, 2nd price – student presentation competition, ESA President’s Prize

2008: Kate Ihle, selected Junior Scientist Presentation, GRC “Genes and Behavior”

2006-2008: Florian Wolschin, Humboldt Foundation, Feodor Lynen Postdoc Fellowship

2008-2011: Siri-Christine Seehuus, Norwegian Research Council, Independent Investigator Award

2008: Navdeep Mutti, selected Lecture, Keystone Symposia “Metabolic Pathways and Longevity”

Teaching experience*Gjermundnes Agricultural College, Vikebukt, Norway:*

- Conservation Biology, courses VKI and VKII (with lab and field sessions)
- General Biology (with lab)

Norwegian University of Life Sciences

- Computational Population Dynamics HFX220 (with computer lab)
- Social Insect Biology HFX208 (with lab and field sessions)

Arizona State University

- Animal Physiology BIO360 (180)
- Animal Physiology laboratory BIO361 (60)
- Survival Analysis BIO 590/790 (2)
- Biology of Aging (20)
- Undergraduate internships MBB484 (4), MBB499 (6), BIO492 (1)
- Graduate research BIO792 (3)

Master students

2001-2002: Anne Lene T.O. Aase, ”Rearing genetically manipulated honey bee workers *in vivo*”, co-advisor with Dr. Stig W. Omholt

2006-2008: Kari-Anne Nilsen, “Insulin/insulin-like signaling in regulation of social behavior”

2007-present: Bente Smedal, “Extreme longevity in honey bees – role of pheromonal signaling”

2007-present: Nickolas Baker, “Social regulation of honey bee cognitive dysfunction”

Ph.D. students

2003-2006: Siri-Christine Seehuus. “Visualization of vitellogenin dynamics and associated physiology in the honey bee (*Apis mellifera*)”

2005-present: Kate Ihle, “Role of *vitellogenin* gene activity in the control of insect division of labor and task specialization”, co-advisor with Dr. Robert E. Page

2006-present: Adam Dolezal, “Reproductive signaling systems in ant division of labor”, co-advisor

with Dr. Bert Hoelldobler

2007-present: Martin Speth, “Evolutionary remodeling of insulin/insulin like signaling – implications for social regulation of honey bee neuronal aging”

Postdocs

2006-2008: Siri-Christine Seehuus. “Social control of honey bee neuronal aging”

2007-present: Daniel Münch. “Physiological plasticity of honey bee neuronal aging”

2006-present: Navdeep Mutti. “Regulation of social insect life-histories by microRNA”

2007-present: Christina Tolfsen. “Proteomics of honey bee neuronal aging”

2007-present: Ying Wang. “eQTL mapping of candidate genes for social foraging behavior”

2006-present: Florian Wolschin. “Honey bee comparative proteomics”

Published photos

1. Cover illustration of *Nature*, issue 439: January 5th 2006

2. Editors choice *Proceedings of the National Academy of Science USA*, no. 4: January 24th 2006

3. Editors choice *PLoS Biology*, no 5: March 2007

4. Cover illustration, *Naturwissenschaften*, no 94: April 2007

5. Cover illustration, *BioEssays*, no 29: April 2007

6. Editors choice *Proceedings of the National Academy of Science USA*, vol. 104: August 15th 2007

7. Chapter cover illustration, “The Superorganism” B. Hölldobler and E.O. Wilson, in press 2008

8. Cover illustration, *Functional Ecology*, Vol. 22, no 3, 2008

Publications

Articles:

1. **Amdam, G.V.** and Omholt, S.W. (2002) The regulatory anatomy of honeybee lifespan. *Journal of Theoretical Biology* 216: 209-228

2. **Amdam, G.V.**, Simões, Z.L.P., Guidugli, K.R., Norberg, K. and Omholt, S.W. (2003) Disruption of vitellogenin gene function in adult honeybees by intra-abdominal injection of double-stranded RNA. *BMC Biotechnology* 3:1

3. **Amdam, G.V.**, Norberg, K., Hagen, A. and Omholt, S.W. (2003) Social exploitation of vitellogenin. *Proceedings of the National Academy of Science USA* 100: 1799-1802

4. **Amdam, G.V.** and Omholt, S.W. (2003) The hive bee to forager transition in honeybee colonies: The double repressor hypothesis. *Journal of Theoretical Biology* 223: 451-464

5. Rueppell, O., **Amdam, G.V.**, Page, R.E. and Carey, J.R. (2004) From genes to societies. *Science of Aging Knowledge Environment* 5: pe5

6. **Amdam, G.V.**, Simões, Z.L.P., Hagen A., Norberg K., Schröder K., Mikkelsen Ø., Kirkwood, T.B.L. and Omholt, S.W. (2004) Hormonal control of the yolk precursor vitellogenin regulates immune function and longevity in honeybees. *Experimental Gerontology* 39: 767-773

7. Omholt, S.W. and **Amdam, G.V.** (2004) Epigenic regulation of aging in honeybee workers. *Science of Aging Knowledge Environment* 26: pe28

8. **Amdam, G.V.**, Hartfelder, K., Norberg, K., Hagen, A. and Omholt, S.W. (2004) Altered physiology in worker bees infested with *Varroa destructor* as a factor in colony loss during overwintering. *Journal of Economic Entomology* 97: 741-747
9. **Amdam, G.V.**, Norberg, K., Fondrk, M.K. and Page, R.E. (2004) Reproductive ground plan may mediate colony-level selection effects on individual foraging behavior in honey bees. *Proceedings of the National Academy of Science USA* 101: 11350-11355
10. Hunt, H. J. and **Amdam, G.V.** (2005) Bivoltinism as an Antecedent to Eusociality in the Paper Wasp Genus *Polistes*. *Science* 308: 264-267
11. Aase, A.T.O, **Amdam, G.V.**, Hagen, A. and Omholt, S.W. (2005) A new method for rearing genetically manipulated honey bee workers. *Apidologie* 36: 293-299
12. **Amdam, G.V.** and Page, R.E. (2005) Stage-dependent transfer profiles may have decoupled physiological and chronological age in a eusocial insect. *Aging Research Reviews* 4: 398-408
13. Guidugli, K.R., Nascimento, A.M., **Amdam, G.V.**, Barchuk, A.R., Omholt, S.W., Simões, Z.L.P., Hartfelder, K. (2005) Vitellogenin regulates hormonal dynamics in the worker caste of a eusocial insect. 579: 4961-4965, *FEBS Letters*
14. **Amdam, G.V.**, Aase, A.T.O., Seehuus, S.-C., Fondrk, M.K., Norberg, K., Hartfelder, K. (2005) Social reversal of immunosenescence in honey bee workers. *Experimental Gerontology* 40: 939-947
15. **Amdam, G.V.**, Norberg, K., Omholt, S.W., Kryger, P., Lourenço, A. Bitondi, M.G. and Simões, Z.L.P. (2005) Higher vitellogenin concentrations in honey bee workers may be an adaptation to life in temperate climates. *Insectes Sociaux* 52: 316-319
16. **Amdam, G.V.**, Csondes, A., Fondrk, M.K. and Page, R.E. (2006) Complex social behaviour derived from maternal reproductive traits. *Nature* 439: 76-78. With Cover
17. Seehuus, S.-C., Norberg, K., Gimsa, U., Krekling, T. and **Amdam, G.V.** (2006) Reproductive protein protects sterile honey bee workers from oxidative stress. *Proceedings of the National Academy of Science USA* 103: 962-967. With Editorial
18. **Amdam, G.V.**, Page, R.E., Erber, J. and Scheiner, R. (2006) Downregulation of vitellogenin gene activity increases the gustatory responsiveness of honey bee workers (*Apis mellifera*). *Behavioral Brain Research* 169: 201-205
19. Page, R.E., Scheiner, R., Erber, J. and **Amdam, G.V.** (2006) The development and evolution of division of labor and foraging specialization in a social insect (*Apis mellifera* L.). *Current Trends in Developmental Biology* 74: 251-284
20. **Amdam, G.V.** and Seehuus, S.-C. (2006) Order, disorder, death: Lessons from a superorganism. *Advances in Cancer Research* 95: 31-60
21. Seehuus, S.-C., Krekling, T. and **Amdam, G.V.** (2006) Cellular senescence in honey bee brain is largely independent of chronological age. *Experimental Gerontology* 41: 1117-1125
22. The Honeybee Genome Sequencing Consortium, including **Amdam, G.V.** (2006) Insights into social insects from the genome of the honey bee *Apis mellifera*. *Nature* 443: 931-949. With Cover

23. Hunt, G., **Amdam, G.V.**, Schlipalius, D., Rueppell, O., Guzmán-Novoa, E., Arechavaleta-Velasco, M., Chandra, S., Emore C., Fondrk, M.K., Beye, M. and Page, R.E. (2007) Behavioral genomics of honeybee foraging and nest defense. *Naturwissenschaften* 94: 247-267. With Cover
24. Page, R.E. and **Amdam, G.V.** (2007) The making of a social insect: developmental architectures of social design. *Bioessays* 29: 334-343. With Cover
25. Nelson, C.M., Ihle, K., Fondrk, M.K., Page, R.E. and **Amdam, G.V.** (2007) The gene vitellogenin has multiple coordinating effects on social organization. *PLoS Biology* 5: 673-677. With Editorial
26. **Amdam, G.A.**, Nilsen, K.A., Norberg, K., Fondrk, M.K. and Hartfelder, K. (2007) Variation in endocrine signaling underlies variation in social life-history. *The American Naturalist* 170: 38-46
27. Hunt, J.H., Kensinger, B.J., Kossuth, J.A., Henshaw, M.T., Norberg, K., Wolschin, F., and **Amdam G.V.** (2007) A diapause pathway underlies the gyne phenotype in *Polistes* wasps, revealing an evolutionary route to caste-containing insect societies. *Proceedings of the National Academy of Science USA* 104: 14020-14025
28. Patel, A., Fondrk, K.F., Kaftanoglu O., Emore, C., Hunt, G. Frederick, K. and **Amdam, G.A.** (2007) The making of a queen: TOR pathway is a key player in diphenic caste development. *PLoS ONE* 6: e509. Highlighted in *Nature*
29. Wolschin, F. and **Amdam G.V.** (2007) Comparative proteomics reveal characteristics of life-history transitions in a social insect. *Proteome Science* 5: 10
30. Wolschin, F. and **Amdam G.V.** (2007) Plasticity and robustness of protein patterns during reversible development in the honey bee (*Apis mellifera*). *Analytical & Bioanalytical Chemistry* 389: 1095-1100
31. Behrends, A., Scheiner, R., Baker, N. and **Amdam, G.V.** (2007) Cognitive aging is linked to social role in honey bees (*Apis mellifera*). *Experimental Gerontology* 42: 1146-1153
32. Seehuus, S.-C., Norberg, K., Krekling, T., Fondrk M.K. and **Amdam, G.V.** (2007) Immunogold localization of vitellogenin in the ovaries, hypopharyngeal glands and head fat bodies of honeybee workers, *Apis mellifera*. *Journal of Insect Science* 7: 52. Featured Paper by JIS
33. Münch, D., **Amdam G.V.**, and Wolschin, F. (2008) Aging in a eusocial insect: molecular and physiological characteristics of life span plasticity in the honey bee. *Functional Ecology*. 22, 407-421. With cover

Book chapters:

1. **Amdam, G.V.** (2005) Social control of aging and frailty in bees. In: *Longevity and Frailty*, Carey, J.R., Robine, J.-M., Michel, J.-P., Christen, Y. (Eds.), Springer-Verlag Berlin, pp. 17-26
2. **Amdam, G.V.** and Rueppell O. (2006) Models of aging in honey bee workers. In: *Handbook of Models for Human Aging*, Conn, P.M. (Ed.), Academic San Diego, pp. 267-276
3. Page, R.E., Linksvayer, T. and **Amdam, G.V.** (2008) Social life from solitary regulatory networks: a new paradigm for insect sociality. In press in: *Organization of Insect Societies*, Gadau,

G., Fewell, J. (Eds.), Harvard University Press, Cambridge MA

4. **Amdam, G.V.**, Ihle, K.E., and Page, R.E. (2008) More than meets the eye – current insights on regulation of worker honey bee (*Apis mellifera*) life histories by vitellogenin. In press in: *Hormones, Brain and Behavior*, Fahrbach, S. (Ed), Elsevier, San Diego CA

In revision or submitted

Articles:

Tsuruda, J.M., **Amdam, G.V.**, Page, R.E. Linkage of ovary size, sensory sensitivity and vitellogenin activity in honey bees suggests social behavior stems from phylogenetically entrenched developmental processes. In revision, *PLoS ONE*

Nilsen, K.A., Ihle, K.E., Frederick, K., Smedal, B., Fondrk M.K., Hartfelder, K. and **Amdam, G.V.** Dual role of insulin-like peptides in the integration of nutritional state, endocrine signaling and social behavior in honeybee workers. Submitted, *Proceedings of the Royal Society B*

Amdam, G.V., Brent, C.S., Fondrk, M.K. and Page, R.E. Footprints of social evolution: heterochrony and the emergence of worker behavior. Submitted, *Proceedings of the National Academy of Science USA*

Scheiner, R. and **Amdam, G.V.** Impaired tactile antennal learning is related to long foraging duration in honey bees. Submitted, *Journal of Experimental Biology*

Invited seminar and symposium presentations

2000: Centre for Regulatory Biology and Non-linear Dynamics, Oslo, Norway

2000: Euro Conference: Molecular mechanisms of disease tolerance in honeybees, Prague, Czech Republic

2001, 2002: University of São Paulo, Ribeirao Preto, Brazil

2001-2003: Annual symposia, Scandinavian Bee Research, Norway/Sweden/Denmark

2002: VIIth International Symposium for Biochemical System Theory: From phenotype to genotype and back, Averøya, Norway

2003: 39th Congress, Biochemical Society of Norway, Geilo, Norway

2004: Duke University, Durham, NC

2004: Humboldt University, Berlin, Germany

2004: Wissenschaftskolleg zu Berlin, Berlin, Germany

2004: Foundation IPSEN, Paris, France

2004: Max Planck Institute, Rostock, Germany

2004: Santa Fe Institute of Complex Studies, Workshop in Würzburg, Germany

2004: IUSSI, North American Section, Phoenix, AZ

2004, 2005: University of California, Berkeley, CA

2004: University of California, Davis, CA

2005: Arizona State University, Tempe, AZ

2005: BeeSpace Annual Workshop, University of Illinois, Urbana-Champaign, IL

2005: Animal Behavior Society, Annual Meeting Symposium, Salt Lake City, UT

2005: UVA Evolutionary Demography Meeting, University of Virginia, VA
2006: Dept. of Animal Science, Norwegian University of Life Sciences, Aas, Norway
2006: Center for Social Dynamics and Complexity, Arizona State University, Tempe, AZ
2006: VII Encontro de Abelhas, University of São Paulo, Ribeirao Preto, Brazil
2006: IUSSI, Washington D.C., plenary lecture
2006: IUSSI, Washington D.C., seminar session
2006: Texas A&M University, TX
2007: University of Arizona, Hexapodium, AZ
2007: Cold Spring Harbor Laboratories, NY (presented by postdoc N. Mutti)
2007: British Society for Research on Ageing, Liverpool, UK (presented by postdoc S-C. Seehuus)
2007: University of Tel Aviv, Israel
2007: Hebrew University of Jerusalem, Israel
2007: Karolinska Institute, Sweden
2007: CEES, University of Oslo, Norway
2007: Kansas State University, KS
2007: Dept. Conservation Biology, Norwegian University of Life Sciences, Norway
2008: University of São Paulo, Ribeirao Preto, Brazil (seminar by postdoc N. Mutti)
2008: Gordon Research Conference, Genes and Behavior, Italy, invited lecture
2008: GRC, Genes and Behavior (data-blitz presentation by graduate student K. Ihle)
2008: Pew Foundation, Annual meeting for PEW Award Scholars, Aruba, Netherlands
2008: McGill University, Canada
2008: Norwegian Biochemical Society, Oslo, Norway
2008: Society for the Study of Evolution, Minneapolis, MN
2008: ICE, Durban, South African, symposium organizer
2008; ICE (seminar presentation by postdoc F. Wolschin)
2008: VII Encontro de Abelhas, University of São Paulo, Ribeirao Preto, Brazil
2008: Rikshospitalet, Oslo (organizer and seminar speaker)