

The 18th International *Aspergillus* Meeting

Asperfest 18

March 14-15, 2022

Asilomar Conference Center, Pacific Grove, CA.

Aspergillus Genomes Research Policy Group (AGRPG)

An Aspergillus Genomics workshop was held at the March 2003 Asilomar Fungal Genetics meeting. From discussions in that workshop it was obvious that our community needed to organize to fully exploit genomics resources. A provisional Aspergillus Genomes Research Policy Committee (AGRPC) was conscripted and charged with creating a structure for community-wide coordination and organizing an annual meeting. The First Aspergillus Meeting was held in Copenhagen, April 21, 2004, as a satellite meeting of the European Congress on Fungal Genetics-7. In addition to scientific presentations, bylaws were approved, community research directions were discussed and the 2004 AGPRC was elected. The name Aspergillus Genomes Research Policy Group was adopted for the community. The objectives of the AGRPG are: (1) Provision of an educational and discussion forum for issues pertaining to Aspergillus genomics, in its widest sense, and for the various Aspergillus research communities; (2) Influencing grant making bodies and other institutions on behalf of the various Aspergillus research communities; (3) Coordinating research activities internationally, as and when required, to further the science base of the Aspergillus genus. For more information on the activities of the AGRPG and other Aspergillus news see our homepage at FGSC (<http://www.fgsc.net/Aspergillus/asperghome.html>).

2021 AGRPC

Isabelle Benoit-Gelber, 2018-2021, Concordia University, Canada; isabelle.benoit@concordia.ca
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Ling Lu, 2019-2022, Nanjing Normal University, China; linglu@njnu.edu.cn
Richard Todd, 2019-2022, Chair and local organizer, Kansas State University, USA; rbtodd@ksu.edu
Michelle Momany, 2020-2023, University of Georgia, USA; mmomany@uga.edu
Gerhard Braus, 2020-2023, Georg-August-University Goettingen, Germany; gbraus@gwdg.de
David Cánovas, 2020-2023, University of Seville, Spain; davidc@us.es
Michael Bromley, 2020-2023, University of Manchester, UK. Mike.Bromley@manchester.ac.uk

THANKS TO OUR MEETING SPONSORS!



Complex and critical roles for the AtrR transcription factor in control of *cyp51A* expression in *Aspergillus fumigatus*.

Sanjoy Paul, *The University of Iowa, USA*.

Distribution of non-canonical septins in fungi.

Brent Shuman, *University of Georgia, USA*.

CRISPR/Cas9-based engineering of *Aspergillus oryzae* mycelium for meat-like flavor and appearance.

Vayu Maini Rekdal, *UC Berkeley, USA*.

The fungal sexual revolution continues: indications of sexuality in the citric acid producing fungus *Aspergillus niger*.

Valeria Ellena, *TU Wien, Austria*.

Olorofim and the azoles are antagonistic in *Aspergillus fumigatus* and functional genomic screens reveal mechanisms of cross resistance.

Norman van Rhijn, *Manchester Fungal Infection Group, UK* .

The *Aspergillus fumigatus* morphogenesis-related kinase, CotA, orchestrates hyphal growth in response to carbon source quality.

Adela Martin-Vincente, *University of Tennessee Health Science Center, USA*.

Oxygen mediated cell-cell heterogeneity and antifungal drug susceptibility in *Aspergillus fumigatus* biofilms.

Kaesi Morelli, *Dartmouth College, USA*.

Program the Future with Ginkgo's Cell Development Kit.

Jesse Dill, *Ginkgo Bioworks, USA*.

10:00-10:30 Coffee Break and Posters

10:30 Session II

New *Aspergillus* labs (cont.)

Robb Cramer

Dartmouth College, USA

Aspergillus fumigatus hexameric septin complex is involved in spore cell wall organization and immune evasion.

Jose Vargas-Muniz, *Southern Illinois University, USA*.

Antifungal screening of 54 single plant essential oils against *Aspergillus fumigatus*.

Yainitza Hernandez-Rodriguez, *Florida Gulf Coast University, USA*.

ncRNAs – novel regulatory links in fungal azole tolerance?

Sourabh Dhingra, *Clemson University, USA*.

11:00 Tools/Resources

Norio Takeshita,
University of Tsukuba, Japan

Structural determination of fungal secondary metabolites using cryo-EM method microcrystal electron diffraction.

Clay Wang, *University of Southern California, USA.*

Enzyme Profile Relatedness in *Aspergillus*

Lene Lange, *BioEconomy, Research & Advisory, Denmark.*

COFUN: Final report on the construction of the genome wide-knockout library in *A. fumigatus*.

Michael Bromley, *University of Manchester, UK.*

FungiDB: what's new and planned at FungiDB.

David Roos *FungiDB*

11:40 Community directions: Discussion; Elections.

Richard Todd
Kansas State University, USA

Discussion; Elections

12:00PM - 1:15PM Lunch

Crocker Dining Hall.

1:15PM Session III: Talks from Abstracts

Michelle Momany
University of Georgia, USA

tRNA-ome of the human fungal pathogen *Aspergillus fumigatus*: high-throughput functional analysis reveals a valine tRNA isodecoder involved in Azole sensitivity

Lauren Dineen, *University of Manchester, UK.*

Duplication, Redundancy, and Divergence: roles of the *Aspergillus nidulans* paralogous transcription factors LeuR and LeuB in leucine biosynthesis, nitrogen assimilation, and transcriptome regulation.

Joel T. Steyer, *Kansas State University, USA.*

Flotillin-dependent membrane microdomains are required for functional phagolysosomes against fungal infections.

Franziska Schmidt, *Leibniz Institute for Natural Product Research and Infection Biology - Hans Knöll Institute & Friedrich Schiller University Jena, Germany.*

Microevolution in the pan-secondary metabolome of *Aspergillus flavus* has macroevolutionary implications for filamentous fungi.

Milton T. Drott, *University of Wisconsin-Madison, USA.*

Quantifying fungal pellets during submerged cultivation: from 3D X-ray microtomography imaging to diffusive mass transport.

Lars Barthel, *Technische Universität Berlin, Germany.*

2:15 Pontecorvo Lecture (sponsored by Zymergen, Inc.) Richard Todd
Kansas State University, USA
Brandon Pfannenstiel
Zymergen, Inc., USA

Ad astra per Aspergillus, from mitosis to natural products chemistry.
Berl Oakley, Irving S. Johnson Distinguished Professor,
University of Kansas, Lawrence, KS, USA.

2:45PM Election results; other discussion items Richard Todd
Kansas State University, USA

Novozymes student poster prize presentation Norio Takeshita,
University of Tsukuba, Japan

3:00PM Dismiss (Remove posters)

List of Posters

Presenter indicated in bold type, * denotes a student poster presenter

1. The narrow footprint of ancient balancing selection surrounding nonself recognition genes in *Aspergillus fumigatus

Ben Auxier, Jianhua Zhang, Eveline Snelders, Alfons Debets.

2. Meiosis in the human pathogenic fungus *Aspergillus fumigatus* produces the highest known number of crossovers

Ben Auxier, Alfons Debets, Joost van den Heuvel, **Eveline Snelders**.

3. Parasexual recombination enables *Aspergillus fumigatus* to persist in cystic fibrosis

Tobias Engel, Paul Verweij, Joost van den Heuvel, Dechen Wangmo, Jianhua Zhang, Ben Auxier, Alfons Debets, **Eveline Snelders**.

4. The C₂H₂ transcription factor SltA is involved in conidial germination and hyphal elongation in *Aspergillus fumigatus

Tim Baltussen, Norman van Rhijn, Paul Verweij, Michael Bromley, Willem Melchers.

5. *Aspergillus fumigatus* pan-genome analysis identifies genetic variants associated with human infection

Amelia Barber, Tongta Sae-Ong, Kang Kang, Bastian Seelbinder, Jun Li, Grit Walther, Gianni Panagiotou, Oliver Kurzai.

***6. Quantifying fungal pellets during submerged cultivation: from 3D X-ray microtomography imaging to diffusive mass transport**

Lars Barthel, Stefan Schmideder, Henri Müller, Heiko Briesen, Vera Meyer.

7. COFUN: Final report on the construction of the genome wide-knockout library in *A. fumigatus*

Michael Bromley, Can Zhao, Lauren Dineen, Isabelle Storer, Thorsten Heinekamp, Axel Brakhage, Daniela Delneri, Paul Bowyer, Ressa Sinaia Lebedinec.

***8. The molecular resistance mechanisms and population structure of azole-resistant *Aspergillus fumigatus* present on commercial agricultural products in the United States**

Caroline Burks, Natalie Miller, Douglas Vines, Michelle Momany, Paul Severns, Marin Brewer.

***9. MERLIN unlocks the secrets to chitin signaling: Using gene-network inference to predict mediators of fungal response to lipo-chitooligosaccharides**

Cristobal Carrera Carriel, Spencer Halberg-Spencer, Saptarshi Pyne, Jean-Michel Ané, Nancy P. Keller, Sushmita Roy.

***10. Analysis of 439 Cyp51 protein sequences shows 5 major Cyp51 gene family groups across Fungi**

Brandi Celia, Michelle Momany, Marin Brewer.

11. Uncovering long non-coding RNA associated with drug response in *Aspergillus fumigatus

Danielle Weaver, **Harry Chown**, Takanori Furukawa, Fabio Gsaller, Daniella Delneri, Paul Bowyer, Michael J. Bromley.

***12. tRNA-ome of the human fungal pathogen *Aspergillus fumigatus*: high-throughput functional analysis reveals a valine tRNA isodecoder involved in Azole sensitivity**

Lauren Dineen, Ressa Lebedinec, Marcin Fraczek, Can Zhao, Daniela Delneri, Paul Bowyer, Mike Bromley.

13. Microevolution in the pan-secondary metabolome of *Aspergillus flavus* has macroevolutionary implications for filamentous fungi

Milton T. Drott, Tomás A. Rush, Tatum R. Satterlee, Richard J. Giannone, Paul E. Abraham, Claudio Greco, Nandhitha Venkatesh, Jeffrey M. Skerker, N. Louise Glass, Jesse L. Labbé, Michael G. Milgroom, Nancy P. Keller.

14. The fungal sexual revolution continues: indications of sexuality in the citric acid producing fungus *Aspergillus niger*.

Valeria Ellena, Matthias Steiger.

15. Primary, secondary and tertiary metabolites, proteins and carbohydrates

Jens Frisvad.

***16. *Aspergillus niger* conidial germination: 3D live cell exploration**

Susanne Fritsche, Matthias Steiger.

17. *Aspergillus fumigatus* Septation Initiation Network (SIN) kinases contribute to fungal pathogenesis, cell wall construction, and rRNA metabolism.

Xabier Guruceaga, Adela Martin-Vicente, Ana Camila Oliveira Souza, Ashley V. Nywening, Harrison Thorn, Jinhong Xie, Wenbo Ge, Brian M. Peters, Jarrod R. Fortwendel.

***18. Targeting *Aspergillus fumigatus* hypoxia response pathways to potentiate contemporary antifungal therapies**

Cecilia Gutierrez Perez, Sourabh Dhingra, Steven M Kwansy, Timothy J Opperman, Robert A Cramer.

19. Transcriptome investigation of *mpkB-mkkB* mutants related to secondary metabolism and sexual development of *Aspergillus nidulans*

Sang-Cheol Jun, Jong-Hwa Kim, **Kap-Hoon Han**.

20. FungiDB: Free online informatic tools for fungal and oomycete biologists

Evelina Basenko, **Omar Harb**, David Roos, presenting on behalf of the entire VEuPathDB Bioinformatics Resource Center.

21. Antifungal Screening of 54 Single Plant Essential Oils Against *Aspergillus fumigatus*

Matthew Swearingen, Elizabeth Myers, **Yainitza Hernandez-Rodriguez**.

22. A new role in G2-M control revealed by a reciprocal translocation involving the *snxA* shuttling mRNA-binding protein and a GYF-domain protein in *Aspergillus nidulans*

Steven James, Jonathan Palmer, Nancy Keller, Sarah Lea Anglin.

***23. The role of cytochrome c in leukocyte induced *Aspergillus fumigatus* cell death.**

Matthew James, Ko-Wei Liu, Elisa Vesley, Tobias Hohl, Robert Cramer.

24. Human p11-mediated re-direction of phagosomes to the recycling endosome-expulsion pathway induced by fungal pathogen

Leijie Jia, Muhammad Rafiq, Lukáš Radosa, Peter Hortschansky, Thomas Krüger, Franziska Schmidt, Thorsten Heinekamp, Maria Stassbruger, Olaf Kniemeyer, Axel Brakhage.

25. Fungi to the rescue – revolutionizing food production through biotechnology

Britta Winterberg, **Bastian Joehnk**.

26. Unfolded protein response is critical for the corneal pathogenesis of *Aspergillus fumigatus

Manali Kamath, Jorge Lightfoot, Emily Adams, Kevin Fuller.

27. The *ndrC* gene, which is regulated by *nsdD*, controls sexual development in *Aspergillus nidulans*

Yu Kyung Kim, Kap-Hoon Han.

28. *Aspergillus* as model for analyzing the fungal digestive enzyme profile -to be included in species description and classification?

Lene Lange, Kristian Barrett, Anne S Meyer, Jens Christian Frisvad.

29. CRISPR/Cas9-based engineering of *Aspergillus oryzae* mycelium for meat-like flavor and appearance

Vayu Maini Rekdal, Jay Keasling.

30. The *Aspergillus fumigatus* morphogenesis-related kinase, CotA, orchestrates hyphal growth in response to carbon source quality

Adela Martin-Vicente, Xabier Guruceaga, Ashley V Nywening, Jinhong Xie, Harrison I Thorn, Wenbo Ge, Jarrod R Fortwendel.

***31. Oxygen mediated cell-cell heterogeneity and antifungal drug susceptibility in *Aspergillus fumigatus* biofilms**

Kaesi Morelli, Caitlin Kowalski, Robert Cramer.

32. Pathogenic fungi in Norwegian barns - first survey of *Aspergillus fumigatus* azole resistance in Norway

Erik Magnus Nedland Henriksen, Hege Divon, Elin Rolén, Lonny Margrethe Kløvfjell, Ellen Christensen, Ida Skaar.

***33. Computational advances in the discovery of a new class of fungal natural products**

Grant Nickles, Milton Drott, Nancy Keller.

***34. The *Aspergillus fumigatus* Spindle Assembly Checkpoint components, *sldA* and *sldB*, play roles in maintenance of triazole susceptibility**

Ashley Nywening, Adela Martin-Vicente, Wenbo Ge, Xabier Guruceaga Sierra, Jarrod Fortwendel.

35. Computer-Aided, Resistance-Gene-Assisted Genome Mining for Proteasome and HMG-CoA Reductase Inhibitors

Cory Jenkinson, Adam Podgorny, Cooncong Zhong, Berl Oakley.

36. Nanoparticles and pathogenic fungi: a non-uptake delivery

Thomas Orasch, Gauri Gangapurwala, Katherine Gonzalez, Julien Alex, Alicia De San Luis, Antje Vollrath, Christine Weber, Stephanie Hoepfner, Zoltan Cseresnyes, Marc Thilo Figge, Ulrich S. Schubert, Axel A. Brakhage.

37. Complex and critical roles for the AtrR transcription factor in control of *cyp51A* expression in *Aspergillus fumigatus*

Sanjoy Paul, Paul E. Verweij, Willem J.G. Melchers, W. Scott Moye-Rowley.

38. Functional analysis of the bZIP transcription factors AtfA and AtfB in *Aspergillus nidulans*

Beatrix Kocsis, Mi-Kyung Lee, Jae-Hyuk Yu, Istvan Pocsí, Eva Leiter.

39. Interaction of the bZIP-type transcription factors NapA and RsmA in the regulation of oxidative stress defence and sterigmatocystin production of *Aspergillus nidulans*

Bernadett Bákány, Yin Wen-Bing, Beatrix Dienes, Tibor Nagy, Éva Leiter, Tamás Emri, Nancy P. Keller, István Pócsi.

40. Genome-wide analysis of AtfA/AtfB-mediated menadione stress response in *Aspergillus nidulans*

Beatrix Kocsis, Mi-Kyung Lee, Jae-Hyuk Yu, **István Pócsi**, Éva Leiter, Tamás Emri.

41. *cexA* and its regulatory processes – a closer look into the citric acid production mechanism of *Aspergillus niger

Aline Reinfurt, Valeria Ellena, Matthias Steiger.

42. Flotillin-dependent membrane microdomains are required for functional phagolysosomes against fungal infections

Franziska Schmidt, Andreas Thywißen, Marie Goldmann, Cristina Cunha, Zoltán Cseresnyés, Hella Schmidt Schmidt, Muhammad Rafiq, Silvia Galiani, Markus H. Gräler, Georgios Chamilos, João F. Lacerda, António Campos Jr., Christian Eggeling, Marc Thilo Figge, Thorsten Heinekamp, Scott G. Filler, Agostinho Carvalho, Axel A. Brakhage.

***43. Methionine synthase as a target for antifungal drug development**

Jennifer Scott, Benjamin Thornton, Jonathan Fowler, Rachael Fortune-Grant, Riba Thomas, Lydia Taberner, Elaine Bignell, Jorge Amich.

***44. Distribution of non-canonical septins in fungi**

Brent Shuman, Michelle Momany.

45. Investigating germination initiation in the pathogenic fungus *Aspergillus fumigatus

Justina Stanislaw, Michelle Momany.

***46. Duplication, Redundancy, and Divergence: roles of the *Aspergillus nidulans* paralogous transcription factors LeuR and LeuB in leucine biosynthesis, nitrogen assimilation, and transcriptome regulation**

Joel T. Steyer, Damien J. Downes, Cameron C. Hunter, Richard B. Todd.

47. Identification of a protein-protein interaction site essential for mitotic entry to guide antifungal drug design in *Aspergillus fumigatus

Isabelle Storer, Benjamin Thornton, Lydia Taberner, Michael Bromley.

48. A versatile selection free CRISPR-Cas9 transformation system for *A. fumigatus*

Norman van Rhijn, Takanori Furukawa, Lauren Dineen, Tim Baltussen, Jochem Buil, Paul Verweij, Willem Melchers, Michael Bromley.

49. Olorofim and the azoles are antagonistic in *Aspergillus fumigatus* and functional genomic screens reveal mechanisms of cross resistance.

Norman van Rhijn, Sam Hemmings, Clara Valero, Jorge Amich, Mike Bromley.

50. *Aspergillus fumigatus* hexameric septin complex is involved in spore cell wall organization and immune evasion

Alban Sinani, Wyatt Boyer, **José Vargas-Muñiz**.

51. Structural characterization of secondary metabolites from filamentous fungi.

Shu Yi Lin, C. Elizabeth Oakley, Cory Benjamin Jenkinson, Berl Oakley, **Clay C. C. Wang**.

Presenting Authors

(Alphabetical; Student presenters in bold type with asterisk)

Presenter	Poster number
Auxier, Ben	1*
Baltussen, Tim	4*
Barber, Amelia	5
Barthel, Lars	6*
Bromley Michael	7
Burks, Caroline	8*
Carrera Carriel, Cristobal	9*
Celia, Brandi	10*
Chown, Harry	11*
Dineen, Lauren,	12*
Drott, Milton T.	13
Ellena, Valeria	14
Frisvad, Jens	15
Fritsche, Susanne	16*
Guruceaga, Xabier	17
Gutierrez Perez, Cecilia	18*
Han, Kap-Hoon	19
Harb, Omar	20
Hernandez-Rodriguez, Yainitza	21
James, Steven	22
James, Matthew	23*
Jia, Leijie	24
Joehnk, Bastian	25
Kamath, Manali	26*
Kim, Yu Kyung	27
Lange, Lene	28
Maini Rekdal, Vayu	29
Martin-Vicente, Adela	30
Morelli, Kaesi	31*
Nedland Henriksen, Erik Magnus	32
Nickles, Grant	33*
Nywenning, Ashley	34*
Oakley, Berl	35
Orasch, Thomas	36
Paul, Sanjoy	37
Pocsi, Istvan	38
Pocsi, Istvan	39
Pocsi, Istvan	40
Reinfurt, Aline	41*
Schmidt, Franziska	42
Scott, Jennifer	43*
Shuman, Brent	44*
Snelders, Eveline	2
Snelders, Eveline	3
Stanislaw, Justina	45*
Steyer, Joel T	46*
Storer, Isabelle	47*
van Rhijn, Norman	48
van Rhijn, Norman	49
Vargas-Muñiz, José	50
Wang, Clay C. C.	51

Student Presenting Authors

(Alphabetical)

7:00-8:30 Even

Baltussen, Tim	4*
Barthel, Lars	6*
Burks, Caroline	8*
Celia, Brandi	10*
Dineen, Lauren,	12*
Fritsche, Susanne	16*
Gutierrez Perez, Cecilia	18*
Kamath, Manali	26*
Nywening, Ashley	34*
Shuman, Brent	44*
Steyer, Joel T.	46*

8:30-10:00 Odd

Auxier, Ben	1*
Carrera Carriel, Cristobal	9*
Chown, Harry	11*
James, Matthew	23*
Morelli, Kaesi	31*
Nickles, Grant	33*
Reinfurt, Aline	41*
Scott, Jennifer	43*
Stanislaw, Justina	45*
Storer, Isabelle	47*