

CURRICULUM VITAE

University of Idaho

NAME: Eva M. Top

DATE: 2-15-2016

RANK OR TITLE: Professor

DEPARTMENT: Biological Sciences

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DATE OF FIRST EMPLOYMENT AT UI: 07/22/2001

DATE OF TENURE: 08/20/2007

DATE OF PRESENT RANK OR TITLE: 08/18/2008

SHORT BIOSKETCH:

Dr. Top is Professor of Biology at the University of Idaho. She received her Masters and Ph.D. degrees from the Ghent University in Belgium. Her research is currently focused on the ecology and evolution of multi-drug resistance (MDR) plasmids in bacteria. Since rapid spread of MDR to human pathogens threatens our fight against infectious diseases, novel therapies are needed that limit the spread of new resistance genes. However, the factors that determine successful transfer and persistence of MDR plasmids are still poorly understood. Her main research questions focus on the evolutionary mechanisms and dynamics of plasmid host range evolution, including the effects of biofilm growth on these processes. She is also interested in the diversity and evolutionary history of natural MDR plasmids, and studies the effects of spreading dairy manure on the abundance and diversity of MDR plasmids in soils.

Dr. Top is currently the Director of the Bioinformatics and Computational Biology graduate program at the University of Idaho (BCB). She is also an associate editor for the journal *Plasmid*, serves on the editorial board of the *ISME Journal*, is a current member of the grant review panel 'Functional Biology' of the Fund for Scientific Research Flanders, and has been a member of the NIH study section GVE for the past four years.

EDUCATION BEYOND HIGH SCHOOL:

Degrees:

Ph.D., Agricultural Sciences, Ghent University, Ghent, Belgium (summa cum laude). March 1, 1993; Research area: Microbial Ecology. Major Professor: Prof. Willy Verstraete; co-adviser: Prof. Max Mergeay.

Bachelors/Masters degree in Bioengineering, Ghent University, Belgium (summa cum laude). July 1989; Specialization: Industrial Biology and Industrial Microbiology. Major Professor: Prof. Willy Verstraete; co-adviser: Prof. Max Mergeay. (These five years of university education are equivalent to a Masters degree in Science)

EXPERIENCE:

Teaching, Extension and Research Appointments:

- 2008 – present: Professor of Biology, University of Idaho, Department of Biological Sciences.
- 2003 – present Affiliate faculty Department of Microbiology, University of Washington
- 2004 – 2008: Associate Professor of Biology, University of Idaho, Department of Biological Sciences.
- 2004 – 2011: Adjunct faculty in the Department of Microbiology, Molecular Biology and Biochemistry, College of Agricultural and Life Sciences.
- 2001- 2004: Research Associate Professor, University of Idaho, Department of Biological Sciences.
- 2000 - 2003: Assistant Professor (Docent) of Environmental Microbiology at the Faculty of Agricultural and Applied Biological Sciences, Ghent University, Belgium. Leave of absence from July 2001 till June 2003.
- 1997 - 2000: ‘Research Leader’ (Onderzoeksleider) with the Research Foundation Flanders (FWO) (0.9 FTE) and Assistant Professor (Docent) of Environmental Microbiology (0.1 FTE) at the Faculty of Agricultural and Applied Biological Sciences, Ghent University, Belgium.
- 1996 - 1997: ‘Research Leader’ (Onderzoeksleider) with the Research Foundation Flanders (FWO), affiliated with the Laboratory of Microbial Ecology and Technology (Prof. Dr. ir. Willy Verstraete), Faculty of Agricultural and Applied Biological Sciences, Ghent University, Belgium.
- 1995 - 1996: Postdoctoral Researcher – Fellow of the Belgian National Research Fund (NFWO), Laboratory of Microbial Ecology (Prof. Dr. ir. Willy Verstraete), Faculty of Agricultural and Applied Biological Sciences, Ghent University, Belgium.
- 1993 - 1994: Postdoctoral Researcher - Fellow of the Belgian National Research Fund (NFWO) and the NSF Center for Microbial Ecology, Michigan State University, East Lansing, Michigan.

Academic Administrative Appointments:

- 2012-2015: Director BCB graduate program (Bioinformatics and Computational Biology)

TEACHING ACCOMPLISHMENTS: (Academic and Extension teaching)

Courses Taught: (title, course number, date(s))

- BIOL 250 (formerly MMBB 250), General Microbiology. Fall ’13 – present (~125 students)
- BIOL 411, Senior Capstone: Fall ‘04-‘12. First each semester, then each Fall semester.
- BIOL 552, Professional Development for Biologists: Seven semesters between 2005 and 2012.
- BIOL 501/MATH 501/BCB 501, Biocomplexity (Co-Instructor with Dr. S. Krone): Fall ’02, Spring ’03, Spring ’05, Fall ’07, Spring ’09, Spring ’10.
- “Molecular aspects in Microbial Ecology” (in Dutch, Ghent University); Spring semesters 1997-2001.
- Several guest lectures in ‘Processes in Microbial Ecology’ and ‘Environmental Microbiology’ taught by Prof. W. Verstraete, (in Dutch and English, Ghent University; 1995-2001.
- Instructor for Laboratory course “Processes in Microbial Ecology” (in Dutch, Ghent University);

each Spring 1996-2001.

Teaching Assistant for Laboratory course “Processes in Microbial Ecology” (in Dutch, Ghent University); 1995.

Teaching Assistant for Laboratory course ‘Environmental Microbiology’ (in English, Ghent University); 1989-1992.

Students Advised:

Undergraduate Students: (advised to completion of degree, number per year)

I advise ~8-12 undergraduate students per year.

I have also involved at least 45 undergraduate students in my research projects over the past 14 years at UI (A. Avery, E. Bach, K. Bashford, S. Bassler, M. Bauer, N. Buckenberger, S. Burleigh, B. Cornwell, A. Crabtree, K. Dong, M. Flory, R. Fox, R. Gibson, A. Henrichs, J. Johnson, B. Kohler, M. Knox, P. Krinke, A. Krone, J. Lacroix, G. Lilly, B. Lohman, S. Lyon, K. McTighe, E. Mintzer, B. Nygaard, N. Packer, D. Perry, R. Regmi, C. Renfrow, I. Rule, S. Sax, R. Simmons, K. Turner, L. Sherick, J. Shirley, B. Solano, A. Smith, Z. Smith, L. Snyder, K. Sussman, P. Van Wie, W. Weibler, T. Wilkinson, J. Williams).

Graduate Students:

Current:

Genevieve Metzger, Ph.D. in Bioinformatics and Computation Biology
Bethel Kohler, M.S. in Bioinformatics and Computational Biology

Advised to completion of degree-major professor:

University of Idaho:

Allison Tucker, M.S. in Bioinformatics and Computation Biology, August 2014
Diya Sen, Ph.D. in Bioinformatics and Computation Biology, October 2011
Julie Hughes, Masters in Biology, June 2011
Randal Fox; Master of Science in Microbiology, Molecular Biology and Biochemistry;
August 2007
Leen De Gelder; Ph.D in Biology; August 2006

Ghent University, Belgium – Ph.D.:

Winnie Dejonghe; Ph.D in Applied Biological Sciences; June 2003.
Nico Boon; Ph.D. in Applied Biological Sciences; June 2002

Ghent University, Belgium – Masters in Bio-engineering and Masters in Environmental Sanitation: One-year thesis projects.

Ann Dierickx; Masters in Bio-engineering; July 2001.
Veerle De Dobbeleer; Masters in Bio-engineering; July 2001.
Wim De Windt; Masters in Bio-engineering; July 2001.
Kristof Verthé; Masters in Bio-engineering; July 2001.
Sven Blomme; Masters in Bio-engineering; September 2000.
Hanne Lievens; Masters in Bio-engineering; July 2000.
Gwen Fallony; Masters in Bio-engineering; July 2000.
Rogier De Waele; Masters in Environmental Sanitation; July 2000.

Tim Verresen; Masters in Bio-engineering; September 1999.
Eric Vanderdonck; Masters in Bio-engineering; September 1999.
Liliana Rozo; Masters in Environmental Sanitation; July 1999.
Nico Boon; Masters in Bio-engineering; July 1998
Oliver Grunert; Masters in Bio-engineering; July 1998

Served on graduate committee:

Current:

Roxanna Hickey; Ph.D. in Bioinformatics and Computational Biology (BCB); 2010-present
Andrea Hanson, Ph.D. in Microbiology, 2010-2015
Michael France; Ph.D. in BCB; 2012-present
Danika Hill, MS Environmental Science; 2014-present

Past (students who have graduated):

Luyi Zhao (M.S Biology, 2008-2012); Thea Lu (Ph.D. Microbiology, 2007-2012);
Sanqing Yuan (M.S. BCB, 2007-2011); Anna Kolodziejek (Ph.D. Microbiology and
Molecular Biology, 2004-2010); Zev Kronenberg (M.S. Biology, 2008-2010); Xue
Zhong (Ph.D. BCB, 2004-2009); Ursel Shuette (Ph.D. Biology, 2002-2009); Darin
Rokyta (Ph.D. BCB, 2002-2006); Min Jin Kang (Ph.D. Microbiology and Molecular
Biology, 2002-2006); Jose Ponciano (Ph.D. BCB, 2004-2006); Jennifer Beachler (Art
MFA, 2006-2008); Jacek Patryn (M.S. Microbiology and Molecular Biology, 2007-
2009); Jeremy Nelson (M.S. in Microbiology and Molecular Biology, 2003-2004).

External Member of Ph.D. Committees:

Pauline Modrie, University of Louvan-la-Neuve, Belgium, August 2012
Murugan Subbiah, Washington State University, 2011
Benny Pycke, Ghent University, Belgium, December 15, 2009
Sofie Dobbelaere. Catholic University of Leuven, Belgium, May 2002.
Marie-Eve Gstalder. Free University of Brussels, Belgium, November 2001.
Inga Sarand. University of Helsinki, Finland, August 2000. Sole opponent.
Sandrine Troussieux. University Claude Bernard Lyon 1, France, June 2000.
Sébastien Goux. Catholic University of Louvain-la-Neuve, Belgium, March 2000.
Clotaire Yantze Kontchou. Habilitation à diriger des recherches en sciences naturelles.
Université des Sciences et Technologies de Lille, France, July 1999.
Hugo C.R. Saad. Agricultural University Wageningen, The Netherlands, June 1999.

Courses Developed:

BIOL 250 (formerly MMBB 250): General Microbiology: based on textbook Brock Biology of
Microorganisms
Molecular aspects in Microbial Ecology (taught in Dutch, see 'Courses taught' above)
Biol 411: Concept was developed previously but I chose different topics and books/articles to read
and discuss with the students

Non-credit Classes, Workshops, Seminars, Invited Lectures, etc.: (Invited lectures at workshops – For remainder of invited lectures and seminars: See ‘Scholarship Accomplishments’)

- 2006, 2008, 2009, 2010, 2011, 2013: Short course for students of the University of Puerto Rico Mayaguez, ‘Advances in Tropical Microbial Ecology’, with Profs. A. Massol and L. Forney.
- 2001 The role of horizontal gene transfer in the adaptation of bacterial communities to xenobiotic compounds. Lecture at the Woods Hole Summer Course on Microbial Diversity, Woods Hole, MT, July 6, 2001.
- 2002 Evening Lecture (2 h) for students of the 'technical college' ‘Katholieke Hogeschool St. Lieven’ (Belgium), which trains laboratory technicians. Title: Molecular techniques in environmental microbiology: a new view on the enormous biodiversity. Ghent, Belgium, May 7, 2001.
- 1995 'Bioremediatie van verontreinigde gronden: toepassingen, beperkingen en toekomstperspektieven'. KVIV-VMD Course series: 'Het decreet betreffende de bodemsanering. De praktische toepassingen van een nieuwe wetgeving'. Antwerpen, April 26-27, 1995.
- 1992 'Mikrobiële ekologie en het gebruik van gemerkte bakteriestammen': Microbial Ecology and the use of marked bacterial strains. VLAB-Workshop 'Het gebruik van transponeerbare elementen voor de konstruktie van bakteriestammen met leefmilieu toepassingen.' V.I.T.O., Mol, Belgium, September 7-18, 1992.

SCHOLARSHIP ACCOMPLISHMENTS:

Publications:

Peer Reviewed/Evaluated:

Publications in peer-reviewed journals:

1. Stalder, T., and **E.M. Top**. 2016. Plasmid transfer in biofilms: A perspective on limitations and opportunities. NPJ Biofilms and Microbiomes. In press.
2. Yano H., K. Wegrzyn, W. Loftie-Eaton, J. Johnson, G.E. Deckert, L.M. Rogers, I. Konieczny, and **E.M. Top**. 2016. Evolved plasmid-host interactions reduce plasmid interference cost. Mol Microbiol. In press. (doi: 10.1111/mmi.13407. Epub ahead of print)
3. Li, H., Z. Xu, S. Yang, X. Li, **E.M. Top**, R. Wang, Y. Zhang, J. Cai, F. Yao, X. Han, and Y. Jiang. 2016. Responses of soil bacterial communities to nitrogen deposition and precipitation increment are closely linked with aboveground community variation. Microb. Ecol. 71:974-989 (doi: 10.1007/s00248-016-0730-z).
4. Loftie-Eaton, W. H. Yano, S. Burleigh, R.S. Simmons, J.M. Hughes, L.M. Rogers, S.S. Hunter, M.L. Settles, L.J. Forney, J.M. Ponciano, and **E.M. Top**. 2016. Evolutionary paths that expand plasmid host-range: implications for spread of antibiotic resistance. Mol. Biol. Evol. 33: 885–897. (doi:10.1093/molbev/msv339)
5. Li, X., Y. Wang, C. Brown, F. Yao, Y. Jiang, **E.M. Top**, and H. Li. 2016. Diversification of broad host range plasmids correlates with the presence of antibiotic resistance genes. FEMS Microbiol. Ecol. 92: In press. (doi: <http://dx.doi.org/10.1093/femsec/fiv151>)
6. Borgogna, T. R., J-L. Borgogna, J.A. Mielke, C.J. Brown, **E.M. Top**, R.T. Botts, and D.E. Cummings. 2016. High diversity of CTX-M extended-spectrum β -lactamases in municipal wastewater and urban wetlands. Microbial Drug Resistance 22: 312-320.

7. Li, X., **E. M. Top**, Y. Wang, C. J. Brown, Y. Jiang, and H. Li. 2015. The broad-host-range plasmid pSFA231 isolated from petroleum-contaminated sediment represents a new member of the PromA plasmid family. *Frontiers in Microbiology* 5: 777 (1-12).
8. Loftie-Eaton, W., A. Tucker, A. Norton, and **E.M. Top**. 2014. Flow cytometry and Real-Time qPCR as tools for assessing plasmid persistence. *Appl Environ Microbiol.* 80: 5439-5446 (PMCID: PMC4136099).
9. Brown, C. J., D. Sen, H. Yano, M. L. Bauer, L. M. Rogers, G. A. Van der Auwera, and E. M. **Top**. 2013. Diverse broad-host-range plasmids from freshwater carry few accessory genes. *Appl. Environ. Microbiol.* 79: 7684-7695. (PMCID: PMC3837812)
10. Yano, H., L.M. Rogers, M.G. Knox, H. Heuer, K. Smalla, C.J. Brown, and E.M. **Top**. 2013. Host range diversification within the IncP-1 plasmid group. *Microbiology* 159: 2303-2315. (PMCID: PMC3836486)
11. Oliveira, C.S., A. Moura, I. Henriques, C.J. Brown, L.M. Rogers, **E.M. Top**, and A. Correia. 2013. Comparative genomics of IncP-1 ϵ plasmids from water environments reveals diverse and unique accessory genetic elements. *Plasmid* 70: 412-149.
12. Król, J. E., A. J. Wojtowicz, L. M. Rogers, H. Heuer, K. Smalla, S. M. Krone, and **E.M. Top**. 2013. Invasion of *E. coli* biofilms by multidrug resistance plasmids. *Plasmid* 70: 110–119. (PMCID: PMC3687034)
13. Sen, D., C.J. Brown, **E.M. Top** and J. Sullivan. 2013. Inferring the evolutionary history of IncP-1 plasmids despite incongruence among backbone gene trees. *Mol. Biol. Evol.* 30: 154-166. (PMCID: PMC3525142)
14. Yano H, Genka H, Ohtsubo Y, Nagata Y, **Top E.M.**, Tsuda M. 2013. Cointegrate-resolution of toluene-catabolic transposon Tn4651: Determination of crossover site and the segment required for full resolution activity. *Plasmid* 69: 24–35.
15. Van Meervenne, E., E. Van Coillie, F. Devlieghere, L. Herman, L.S.P. De Gelder, **E.M. Top**, and N. Boon. 2012. Strain specific transfer of antibiotic resistance from an environmental plasmid to foodborne pathogens. *J. Biomed. Biotechnol.* 2012: ID 834598.
16. Hughes, J.M., B.K. Lohman, G.E. Deckert, E.P. Nichols, M. Settles, Z. Abdo, and **E.M. Top**. 2012. The role of clonal interference in the evolutionary dynamics of plasmid-host adaptation. *mBio* 3(4): e00077-12. (PMCID: PMC3398533)
17. Stolze, Y., F. Eikmeyer1, D. Wibberg, G. Brandis, C. Karsten, I. Krahn, S. Schneiker-Bekel, P. Viehöver, A. Barsch, M. Keck, **E. Top**, K. Niehaus, and A. Schlüter. 2012. IncP-1 β plasmids of *Comamonas* sp. and *Delftia* sp. strains isolated from a wastewater treatment plant mediate resistance to and decolorization of the triphenylmethane dye crystal violet. *Microbiology* 158: 2060-2072.
18. Yano, H., G. E. Deckert, L. M. Rogers, and **E.M. Top**. 2012. Roles of long and short replication initiation proteins in the fate of IncP-1 plasmids. *J. Bacteriol.* 194: 1533–1543. (PMCID: PMC3294859)
19. Eikmeyer, F.G., R. Szczepanowski, D. Wibberg, A. Hadiati, S. Schneiker-Bekel, L. M. Rogers, C.J. Brown, **E.M. Top**, A. Pühler, A. Schlüter. 2012. The complete genome sequences of four new IncN plasmids from wastewater treatment plant effluent provide new insights into IncN plasmid diversity and evolution. *Plasmid* 68: 13-24.
20. Heuer, H., C.T.T. Binh, S. Jechalke, C. Kopmann, U. Zimmerling, E. Krögerrecklenfort, T. Ledger, B. Gonzalez, **E.M. Top**, K. Smalla. 2012. IncP-1 ϵ plasmids are important vectors of antibiotic resistance genes in agricultural systems: diversification driven by class 1 integron gene cassettes. *Frontiers in Microbiology* 3: 2.
21. Król, J.E., J.T. Penrod, H. McCaslin, L.M. Rogers, H. Yano, W. Dejonghe, C.J. Brown, R.E. Parales, S. Wuertz, **E.M. Top**. 2012. Genomic and functional analysis of the IncP-1 β plasmids pNB8c and pWDL7::rfp explains their role in 3-chloroaniline catabolism. *Appl. Environ. Microbiol.* 78: 828-838.

22. Zhong, X., J. Droesch, R. Fox, **E.M. Top**, and S. M. Krone. 2012. On the meaning and estimation of plasmid transfer rates for surface-associated and well-mixed bacterial populations. *J. Theor. Biol.* 294: 144–152. (PMCID: PMC3346278)
23. Sen, D., G. Van Der Auwera, L. Rogers, C.M. Thomas, C.J. Brown, and **E.M. Top**. 2011. Broad-host-range plasmids from agricultural soils have IncP-1 backbones with diverse accessory genes. *Appl. Environ. Microbiol.* 77: 7975-7983. (PMCID: PMC3209000)
24. Król, J.E., H. D. Nguyen, L. M. Rogers, H. Beyenal, S. M. Krone, **E.M. Top**. 2011. Increased plasmid transfer in *E. coli* K12 biofilms at the liquid-air interface. *Appl. Environ. Microbiol.* 77: 5079-5088. (PMCID: PMC3147451)
25. Subbiah, M., D. Shah, **E.M. Top**, and D. Call. 2011. The long-term persistence of *bla*CMY-2 positive, IncA/C plasmids requires selection pressure. *Appl. Environ. Microbiol.* 77: 4486-4493. (PMCID: PMC3127679)
26. Szczepanowski R, F. Eikmeyer, J. Harfmann, J. Blom, L.M. Rogers, **E.M. Top**, and A. Schlüter. 2011. Sequencing and comparative analysis of IncP-1 α antibiotic resistance plasmids reveal a highly conserved backbone and differences within accessory regions. *J. Biotechnol.* 155(1): 95-103.
27. Sota, M., H. Yano, J. Hughes, G.W. Daughdrill, Z. Abdo, L.J. Forney, and **E.M. Top**. 2010. Shifts in host range of a promiscuous plasmid through parallel evolution of its replication initiation protein. *The ISME J.* 4: 1568–1580. (doi:10.1038/ismej.2010.72) (PMCID: PMC3042886)
28. Suzuki, H., H. Yano, C.J. Brown and **E.M. Top**. 2010. Predicting plasmid promiscuity based on genomic signature. *J. Bacteriol.* 192: 6045-6055. (doi:10.1128/JB.00277-10) (PMCID: PMC2976448)
29. Król, J.E, L.M. Rogers, S.M. Krone, and **E.M. Top**. 2010. A dual reporter system for *in situ* detection of plasmid transfer in aerobic and anaerobic conditions. *Appl. Environ. Microbiol.* 76: 4553 - 4556 (doi:10.1128/AEM.00226-10) (PMCID: PMC2897451)
30. Sen, D., H. Yano, H. Suzuki, J.E. Król, L. Rogers, C.J. Brown, and **E.M. Top**. 2010. Comparative genomics of pAKD4, the prototype IncP-1 δ plasmid with a complete backbone. *Plasmid* 63: 98-107 (PMCID: PMC2819548).
31. Zhong, X., J. Król, **E.M. Top** and S.M. Krone. 2010. Accounting for mating pair formation in plasmid population dynamics. *J. Theor. Biol.* 262: 711–719. (PMCID: PMC2821984)
32. Van der Auwera, G.A., J.E. Król, H. Suzuki, B. Foster, R. Van Houdt, C.J. Brown, M. Mergeay, and **E.M. Top**. 2009. Plasmids captured in *C. metallidurans*: defining the PromA family of broad-host-range plasmids. *Antonie van Leeuwenhoek* 96:193-204.
33. Heuer, H., C. Kopmann, C.T.T. Binh, **E.M. Top**, and K. Smalla. 2009. Spreading antibiotic resistance through spread manure: characteristics of a novel plasmid type with low %G+C content. *Environ. Microbiol.* 11: 937-949.
34. Suzuki, H., C.J. Brown, L. J. Forney, and **E.M. Top**. 2008. Comparison of correspondence analysis methods for synonymous codon usage in bacteria. *DNA Res.* 15: 357-365. (PMCID: PMC2608848)
35. Suzuki, H., M. Sota, C.J. Brown, and **E.M. Top**. 2008. Using Mahalanobis distance to compare genomic signatures between bacterial plasmids and chromosomes. *Nucl. Acids Res.* 36: e147. (PMCID: PMC2602791).
36. Fox, R., X. Zhong, S.M. Krone, and **E.M. Top**. 2008. Spatial structure and nutrients promote invasion of IncP-1 plasmids in bacterial populations. *The ISME J.* 2: 1024-1039. (PMCID: PMC2605096)

37. De Gelder, L., J. J. Williams, J. Ponciano, M. Sota, and **E.M. Top**. 2008. Adaptive plasmid evolution results in host range expansion of a broad-host-range plasmid. *Genetics* 178: 2179-2190. (PMCID: PMC2323807)
38. Sota, M., and **E.M. Top**. 2008. Host-specific factors determine the persistence of IncP-1 plasmids. *World J. Microbiol. Biotechnol.* 24: 1951-1954.
39. Krone, S.M., R. Lu, R. Fox, H. Suzuki, and **E.M. Top**. 2007. Modeling the spatial dynamics of plasmid transfer and persistence. *Microbiology* 153: 2803-2816 (PMCID: PMC2613009).
40. Schlüter, A., R. Szczepanowski, A. Pühler, and **E.M. Top**. 2007. Genomics of IncP-1 antibiotic resistance plasmids isolated from wastewater treatment plants provides evidence for a widely accessible drug resistance gene pool. *FEMS Microbiol. Rev.* 31: 449-477.
41. Sota, M., M. Tsuda, H. Yano, H. Suzuki, L.J. Forney, and **E.M. Top**. 2007. Region-specific insertion of transposons in combination with selection for high plasmid transferability and stability accounts for the structural similarity of IncP-1 plasmids. *J. Bacteriol.* 189: 3091-3098. (PMCID: PMC1855856)
42. Ponciano, J., L. De Gelder, **E.M. Top**, and P. Joyce. 2007. The population biology of bacterial plasmids: a Hidden-Markov model approach. *Genetics* 176: 957-968. (PMCID: PMC1894622)
43. De Gelder, L., J. M. Ponciano, P. Joyce, and **E.M. Top**. 2007. Stability of a promiscuous plasmid in different hosts: No guarantee for a long-term relationship. *Microbiology* 153: 452-463.
44. Heuer, H., R. Fox, and **E.M. Top**. 2007. Frequent conjugative transfer accelerates adaptation of a broad-host-range plasmid to an unfavourable *Pseudomonas putida* host. *FEMS Microbiol. Ecol.* 59: 738-748.
45. Kamachi, K., M. Sota, Y. Tamai, N. Nagata, T. Konda, T. Inoue, **E.M. Top**, and Y. Arakawa. 2006. Plasmid pBP136 from *Bordetella pertussis* represents an ancestral form of IncP-1 β plasmids without accessory mobile elements. *Microbiology* 152:3477-3484.
46. Sota, M., H. Yano, A. Ono, R. Miyazaki, H. Ishii, H. Genka, **E. M. Top**, and M. Tsuda. 2006. Genomic and functional analysis of the IncP-9 naphthalene-catabolic plasmid NAH7 and its transposon Tn4655 suggests catabolic gene spread by a tyrosine recombinase. *J. Bacteriol.* 188: 4057-4067.
47. Hendrickx, B., W. Dejonghe, F. Fabert, W. Boëne, L. Bastiaens, W. Verstraete, **E.M. Top**, and D. Springael. 2006. PCR-DGGE method to assess the diversity of BTEX mono-oxygenase genes at contaminated sites. *FEMS Microbiol. Ecol.* 55: 262-273.
48. Leys, N., A. Ryngaert, L. Bastiaens, **E.M. Top**, W. Verstraete, and D. Springael. 2005. Culture independent detection of *Sphingomonas* sp. EPA 505 related strains in soils contaminated with polycyclic aromatic hydrocarbons (PAHs). *Microbial Ecology* 49: 443-450.
49. Hendrickx, B., H. Junca, J. Vosahlova, A. Lindner, I. Rüegg, M. Bucheli-Witschel, F. Faber, T. Egli, M. Mau, M. Schlömann, M. Brennerova, V. Brenner, D.H. Pieper, **E.M. Top**, W. Dejonghe, L. Bastiaens, and D. Springael. 2005. Alternative primer sets for PCR detection of genotypes involved in bacterial aerobic BTEX degradation: Distribution of the genes in BTEX degrading isolates and in subsurface soils of a BTEX contaminated industrial site. *J. Microb. Methods.* 64: 250-265.
50. De Gelder, L., F. P.J. Vandecasteele, C. J. Brown, L. J. Forney, and **E.M. Top**. 2005. Plasmid donor affects host range of the promiscuous IncP-1 β plasmid pB10 in an activated sludge microbial community. *Appl. Environ. Microbiol.* 71:5309-5317.
51. Schlüter, A., H. Heuer, R. Szczepanowski, S.M. Poler, S. Schneiker, A. Pühler, and **E.M. Top**. 2005. Plasmid pB8 is closely related to the prototype IncP-1 β plasmid R751 but transfers poorly to *E. coli* and carries a new transposon encoding a small multidrug resistance (SMR) efflux protein. *Plasmid* 54:135-148.

52. Hendrickx, B., W. Dejonghe, W. Boëne, M. Brennerova, M. Cernik, T. Lederer, M. Bucheli-Witschel, L. Bastiaens, W. Verstraete, **E.M. Top**, L. Diels, and D. Springael. 2005. Dynamics of an oligotrophic bacterial aquifer community during contact with a groundwater plume contaminated with benzene, toluene, ethylbenzene, and xylenes: an *in situ* mesocosm study. *Appl. Environ. Microbiol.* 71: 3815-3825.
53. Joyce, P., Z. Abdo, J. Ponciano, L. De Gelder, L.J. Forney, and **E.M. Top**. 2005. Modeling the impact of periodic bottlenecks, unidirectional mutation, and observational error in experimental evolution. *J. Math. Biol.* 50: 645-662.
54. Leys, N., A. Ryngaert, L. Bastiaens, P. Wattiau, **E. Top**, W. Verstraete, and D. Springael. 2005. Occurrence and community composition of fast-growing *Mycobacterium* in soils contaminated with polycyclic aromatic hydrocarbons. *FEMS Microbiol. Ecol.* 51: 375-388.
55. Seghers, D., S.D. Siciliano, **E.M. Top**, and W. Verstraete. 2005. Combined effect of fertilizer and herbicide applications on the abundance, community structure and performance of the soil methanotrophic community. *Soil Biol. Biochem.* 37: 187-193.
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1. Loftie-Eaton, W., H. Suzuki, K. Bashford, H. Heuer, P. Stragier, P. De Vos, M.L. Settles, and **E.M. Top**. 2015. Draft genome sequence of *Pseudomonas* sp. nov. H2. *Genome Announcement* 3: e00241-15. (PMCID: PMC4384497).
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Presentations and Other Creative Activities: (i.e. slide sets, web pages, video productions, etc.):

<http://people.ibest.uidaho.edu/~etop/> (Summer '07)_

<http://people.ibest.uidaho.edu/~etop/vgp/index.html> (the Virtual Genome Project).

Professional Meeting Papers, Workshops:

(Oral presentations upon invitation only [except when mentioned otherwise]; posters and several uninvited talks are not listed; published texts are included under 'Proceedings' above)

- 2016 Top, E.M. The effect of biofilm growth on the evolution of plasmid persistence and permissiveness. International Symposium Plasmid Biology, Cambridge, UK, September 18-23, 2016.
- 2016 Top. E.M. Biofilm growth prevents complete tradeoff between horizontal and vertical transfer in *Acinetobacter baumannii*. Annual BEACON Congress, East Lansing, MI, August 9-13, 2016.
- 2016 Top. E.M. Rapidly improving persistence of antibiotic resistance plasmids and the impact of biofilm growth. Washington State University, Voiland School of Chemical Engineering and Bioengineering, WA, March 28, 2016.
- 2015 Top. E.M. Rapid Evolution of multi-drug resistance plasmids: no general patterns? Western Regional IDEA Conference, Coeur d'Alene, ID, October 13, 2015.
- 2015 Top. E.M. Increased persistence and expanded host range of antibiotic resistance plasmids. Departmental seminar, University of Washington, May 12, 2015. Seattle, WA
- 2015 Top. E.M. Rapidly evolving persistence and host range of drug resistance plasmids. Departmental seminar, Eastern Washington University, April 10, 2015. Cheney, WA
- 2014 Top, E.M. Rapidly improving persistence of multi-drug resistance plasmids in well-mixed populations and spatially structured biofilms. International Society for Plasmid Biology meeting (ISPB). Palm Cove, Australia, October 27-November 1, 2014.
- 2014 Top, E.M. The plasticity of plasmid host range. "The History of Plasmids". Cold Spring Harbor Laboratory, Long Island, New York, September 21-24.
- 2014 Top, E.M. Rapidly evolving multi-drug resistance plasmids: the main threat in a 'post-antibiotic era'. SMBE Satellite Meeting on Reticulate Microbial Evolution. Kiel, Germany, April 27-30, 2014.
- 2013 Top, E.M. Shifts in the Host Range of Promiscuous Drug Resistance Plasmids. University of Montana, Biology Department. Invited seminar, April 29, 2013.
- 2012 Top E.M. Rapid coevolution of plasmid-host pairs contributes to the spread of antibiotic resistance. Symposium 60th Anniversary of the Selman Waksman Nobel Prize in Physiology or Medicine: Antibiotics – Soil's Microbial Miracles. Rutgers University, New Brunswick, New Jersey, December 12, 2012.
- 2012 Top, E.M. Real-time evolution of plasmid persistence by acquisition of toxin-antitoxin systems. International Symposium for Plasmid Biology (ISPB), Santander, Spain, September 12-16, 2012. (not invited but selected from abstracts as oral presentation).
- 2012 Top, E. M. Coevolution between plasmids and their hosts: consequences for the persistence of drug resistance. 14th International Symposium on Microbial Ecology (ISME-14), Copenhagen, Denmark, August 21, 2012.
- 2012 Top, E. M. Sequence based inference of the evolutionary history of plasmids. Roundtable Discussion, 14th International Symposium on Microbial Ecology (ISME-14), Copenhagen, Denmark, August 20, 2012.
- 2012 Top, E.M. Mechanism and dynamics of plasmid-host coevolution. University of Birmingham, UK, School of Biosciences. Invited seminar, April 4, 2012.
- 2012 Top, E.M. Antibiotic resistance is all (resistance genes that are never lost). European Conference of Clinical Microbiology and Infectious Diseases (ECCMID-22), London, UK, March 31 – April 3, 2012.
- 2011 Top, E. M. Mechanism and dynamics of coevolution between drug resistance plasmids and their bacterial hosts. University of Florida, Department of Biology. Invited seminar, November 29, 2011.
- 2011 Top, E. M. Shifts in Bacterial Host Range of Drug Resistance Plasmids: What Does It

- Take? Gene and Linda Voiland School of Chemical Engineering and Bioengineering, Washington State University, Pullman, WA. Invited Seminar, October 3, 2011.
- 2011 Top, E. M. Bacterial plasmids from environment to clinic: Predicting their host reservoirs and promiscuity based on genomic signatures. First International Symposium on Microbial Resource Management in biotechnology: Concepts & applications, Ghent, Belgium, June 30-July 1, 2011 (not invited but selected from abstracts as oral presentation).
- 2010 Top, E. M. Predicting Plasmid Promiscuity Based on Genomic Signature. International Plasmid Biology Conference 2010, November 6-12, Bariloche, Argentina (not invited but selected from abstracts as oral presentation).
- 2010 Top, E.M. Shifts in Host Range of a Promiscuous Plasmid through Parallel Evolution of its Replication Initiation Protein. International Symposium of Microbial Ecology (ISME-13), Seattle, WA, August 22-26, 2010 (not invited but selected from abstracts as oral presentation).
- 2010 Top, E. M. August 4, 2010. Host Shifts in Drug Resistance Plasmids: What Does It Take? Idaho IDEEAs 9th Annual Research Conference. Moscow, ID.
- 2009 Gene transfer in biofilms (Les transferts génétiques au sein des biofilms). Ecole Thématique – CNRS. Microbiologie et physico-chimie des biofilms, October 22, 2009.
- 2009 Top, E.M. Evolution of plasmid host range. Institut Pasteur, Genomes and Genetics Department, October 15, 2009. Invited by Dr. D. Mazel.
- 2009 Shifts in plasmid host range through parallel evolution of the replication initiation protein. Western Region COBRE-INBRE Scientific Conference, Big Sky, Montana. September 18, 2009 (not invited but selected from abstracts as oral presentation).
- 2009 Shifts in plasmid host range through parallel evolution of the replication initiation protein. Evolution 2009, Moscow, ID, June 15, 2009 (not invited but selected from abstracts as oral presentation).
- 2008 Spread of multi-drug resistance among bacteria: Mathematical models to the rescue. Departmental Seminar, Physics Department, University of Idaho, November 17, 2008.
- 2008 Spatial structure and nutrients promote invasion of IncP-1 plasmids in bacterial populations. International Symposium for Plasmid Biology 2008, Gdansk, Poland, September 3, 2008. Invited Speaker and session co-chair.
- 2008 Horizontal gene transfer by broad-host-range plasmids: lessons from *Cupriavidus metallidurans* CH34. Invited speaker at the *Cupriavidus metallidurans* Symposium. Mol, Belgium, April 23, 2008.
- 2008 Promiscuous drug resistance plasmids: Can they further expand their host range? Departmental Seminar University of Liège, Belgium, Centre for Protein Engineering, April 18, 2008. Invited by Dr. Annick Wilmotte.
- 2008 Promiscuous drug resistance plasmids: Can they further expand their host range? Departmental Seminar at the Katholieke Universiteit Leuven, Leuven, Belgium, Centre of Microbial and Plant Genetics, April 16, 2008. Invited by Prof. Jos Vanderleyden.
- 2008 Modeling and monitoring of plasmid spread and persistence in spatially structured populations. Université Catholique de Louvain, Louvain-la-Neuve, Belgium, April 11, 2008. Invited by Prof. Jacques Mahillon.
- 2008 Effects of spatial structure on the spread of multi-drug resistance plasmids: Mathematical models and experiments. Society for General Microbiology, 162nd meeting, symposium "The Horizontal Gene Pool: The Mobilome and Virulence. Edinburgh, U.K., April 1, 2008.
- 2008 Evolving Promiscuity among Drug Resistance Plasmids. Departmental Seminar, Division of Biological Science, UCSD, San Diego, March 6, 2008. Invited by Prof. em. Don Helinski.

- 2007 Drug resistance plasmids can expand their host range. INBRE/COBRE Conference, Moscow (ID), August 6-8.
- 2007 Evolving promiscuity among the agents of bacterial evolution. 9th Symposium on Bacterial Genetics and Ecology (BAGECO), Wernigerode (Germany), June 23-27.
- 2007 Rapid bacterial adaptation through horizontal gene transfer: Implications for health and environment. Idaho Academy of Science 49th Annual Meeting and Symposium, Idaho Falls, April 19 - 21.
- 2006 Degradative plasmids: Natural genetic tools for bacteria and humans to cope with soil pollution. Soil and Water Quality Seminar Series, University of Idaho, October.
- 2006 Adaptive plasmid evolution improves the stability of a broad-host-range plasmid in an unfavorable host. International Symposium on Plasmid Biology, South Lake Tahoe, California, September 23-27, 2006.
- 2006 Promiscuous plasmids in the horizontal gene pool: Can their host range evolve? Seminar invited by the Microbiology Cluster Flanders, funded by the Research Foundation Flanders, Ghent University, Ghent, Belgium, June 21, 2006.
- 2005 Adaptive evolution of promiscuous plasmids. Departmental Seminar, Department of Biological Sciences, University of Alberta, Edmonton Alberta, Canada, November 4, 2005.
- 2005 Adaptive evolution of broad-host-range plasmids: Lessons from retrospective studies and experimental evolution. Gordon Conference on Microbial Population Biology. Andover, July 17-22, 2005.
- 2004 Ecology and evolution of broad-host-range plasmids: Time for new quantitative approaches. Plasmid Biology, Corfu, Greece, September 15-21, 2004.
- 2004 Genetic interactions in bacterial communities via the horizontal gene pool. 21st Century COE Program International Symposium. Microorganisms in Symbiosis with Environment, Tokyo, Japan, September 2, 2004.
- 2004 The horizontal catabolic gene pool, or how microbial communities can rapidly adapt to environmental pollutants. European Symposium on Environmental Biotechnology, Ostend, Belgium, April 25-28, 2004.
- 2004 The cost of promiscuity in Prokaryotes. Seminar series of the Department of Microbiology, Molecular Biology and Biochemistry (MMBB), University of Idaho, Moscow, Idaho, January 22, 2004.
- 2003 Catabolic mobile genetic elements: A bacterial solution to pollution. Society for Industrial Microbiology Annual Meeting, Minneapolis, MN, August 10-14.
- 2003 The role of promiscuous IncP-1 β plasmids in the adaptation of bacterial communities to xenobiotic organic compounds. IBEST Seminar Series, University of Idaho, April 4, 2003.
- 2003 The role of horizontal gene transfer in the evolution of bacteria. Phi Sigma, University of Idaho, September 23, 2003.
- 2002 The role of promiscuous IncP-1 β plasmids in the adaptation of bacterial communities to xenobiotic organic compounds. Seminar Series of the Department of Biological Sciences, University of Idaho, Nov 15, 2002.
- 2002 IncP-1 β plasmids and chloroaromatic degrading β -proteobacteria, from alpha to omega. International Plasmid Biology Symposium, Pittsburgh, PA, June 23-28, 2002
- 2001 Chloroaniline degrading bacteria: genetic diversity and the importance of broad-host-range plasmids. Seminar at the University of Konstanz, Lab. Microbial Ecology (Prof. A. Cook), Germany, February 12, 2001
- 2000 Enhanced biodegradation of chloroaromatic compounds in soil by plasmid mediated bioaugmentation. InterCOST meeting on Bioremediation. Sorrento, Italy, November 15-18, 2000.

- 2000 Recent advances in molecular soil microbial ecology. Lecture at the symposium of the Belgian Society for Soil Sciences: New trends in soil microbial ecology, Brussels, Belgium, November 8.
- 2000 Enhanced biodegradation of chloroaromatic compounds in soils and wastewaters by bioaugmentation. Seminar at the Institute of Water Quality Control and Waste Management (Prof. P. Wilderer and Dr. S. Würtz), Technical University of Munich, Germany, June 26.
- 2000 Enhanced biodegradation of chloroaromatic compounds in soils and wastewaters by bioaugmentation. Seminar at the Laboratory of Microbial Ecology, Université Claude Bernard Lyon 1, France, June 22.
- 2000 Enhanced biodegradation of chloroaromatic compounds in soils and wastewaters by bioaugmentation. Seminar at the Catholic University of Louvain-la-Neuve, Belgium, February 8, 2000.
- 1999 Evidence for plating biases from molecular analyses of a linuron degrading enrichment culture. 6th Symposium on Bacterial Genetics and Ecology (BAGECO-6), Firenze, Italy, June 20-24, 1999.
- 1999 Effect of phenylurea herbicides on soil microbial communities. Ninth European Congress on Biotechnology (ECB9), Brussels, Belgium, July 11-15, 1999.
- 1998 Effect of phenylurea herbicides on soil microbial communities as estimated by molecular and physiological approaches. Joint Working group meeting of COST 831 "Biotechnology of soil: monitoring, conservation and remediation". Rome, Italy, December 10-11, 1998.
- 1998 Effect of mercury addition on plasmid incidence and gene mobilisation capacity in soil. INRA, Dijon, France, June 11, 1998.
- 1996 Diversity of 2,4-dichlorophenoxyacetic acid degradative plasmids captured from soil by genetic complementation. EAWAG, Zürich, Switzerland. June 24, 1996.
- 1996 Plasmid mediated gene transmission in the environment. 4th Symposium of the Belgian National Committee of Microbiology. Biosafety: a scientific challenge in medicine and biotechnology. Brussels, Belgium, March 22, 1996.
- 1996 Dissemination of catabolic plasmids in soil: a tool for bioremediation. SOLVAY Inc., Brussels, Belgium, Nov. 6, 1996.
- 1995 Dissemination of catabolic plasmids in soil: a tool for bioremediation. 7th European Congress on Biotechnology (ECB7), Nice, France, February 19-23, 1995.
- 1995 Effet des plasmides cataboliques sur la biodegradation des polluants de l'environnement. 4ème congrès de la Société Française de Microbiologie (SFM), Tours, France, May 2-5, 1995.
- 1995 Capture of 2,4-dichlorophenoxyacetate degradative genes from soil. International Seminar on Biosorption and Bioremediation, Merín (near Prague), Czech Republic, October 1-4, 1995.
- 1995 Diversity of 2,4-D degradative plasmids isolated from soil microbial communities by complementation. National Environmental Research Institute (NERI), Roskilde, Denmark, October 13, 1995.
- 1994 The use of genetic complementation to assess the diversity of 2,4-D catabolic plasmids in soil. Plasmid Biology Meeting, Banff, Canada, August 25-30, 1994.
- 1994 The significance of degradative plasmids in soil bioremediation. Eighth Forum for Applied Biotechnology, Brugge, September 28-30, 1994.
- 1993 Retromobilization of plasmids in soil microcosms and isolation of mobilizing plasmids from soil habitats. Center for Microbial Ecology, Michigan State University, East Lansing, Michigan, U.S.A., January 15, 1993.

Grants and Contracts Awarded:

Active:

- 1) National Institutes of Health - COBRE – IBEST Pilot Grant
PI: **E. Top**
Title: Determining the natural reservoirs of antibiotic resistance genes
Dates: 7/20/16 to 7/19/2017
Award: \$103,427 (\$74,644 Direct)
Role: PI of the pilot grant
- 2) National Science Foundation - BEACON: an NSF Center for the Study of Evolution in Action
DBI-0939454
PI: E. Goodman (MSU); PI Subproject: E. Top
Title of collaborative subproject: Source-Sink population dynamics facilitate plasmid host-range evolution
8/1/15 to 1/31/17
Award: \$39,119 to **E. Top** (\$27,749 Direct)
Role: PI Subproject - subcontract from MSU
- 3) National Science Foundation - BEACON: an NSF Center for the Study of Evolution in Action
DBI-0939454
PI: E. Goodman (MSU); PI Subproject: Ben Kerr (UW)
Title of collaborative subproject: Use it and lose it: Alternating selection promotes horizontal gene transfer
8/1/15 to 1/31/17
Award: \$28,908 to **E. Top** (\$19,896 Direct)
Role: co-PI Subproject- subcontract from MSU
- 4) US Department of Agriculture NIFA
Award #:2013-67019-21375
PI: Morra, Matthew J.; co-PI's: Moore, A., **Top, E.**, Hammel, J. E., Nagler, J. J., Popova, I.
Title: Chemicals of Emerging Concern in the Eastern Snake River Plain of Idaho: A Threat to Irrigated Agriculture, Dairy, and Aquaculture?
Time period: 09/01/2013 – 08/31/2016, 1-y no cost-extension expected
Amount: \$499,460 (amount to E. Top: \$41,571 + postdoc salary for 3 years)
Role: Co-PI
- 5) National Institutes of Health - NIAID
5R01AI084918
PI's: **E. Top**, J. Ponciano
Title: Plasmids as Vectors of Antibiotic resistance: Evolution of Plasmid Host Range
05/01/2010 to 04/31/2015; no-cost extension till 04/30/2017
Total award: \$1,720,560 (Award for Year 5 [’14-’15]): \$346,108)
- 6) National Science Foundation
DUE 1029485
PI: B. Robison; co-PIs: S. Krone, P. Joyce, E. Rosenblum and **E. Top**
Title: Collaborative Research: UBM - Institutional: UI-WSU Program in Undergraduate Mathematics and Biology
In collaboration with WSU
09/01/2010 - 08/31/2015; no-cost extension till 08/31/2016
Total award: \$ 500,000
Role: Co-PI

Past seven years:

- 1) Department of Defense Congressionally Directed Medical Research Program (CDMRP)
DM110149
PI: **E. Top**
Title: Persistence of Antibiotic Resistance Plasmids in Biofilms
Time period: 09/30/2012 to 09/29/2014, no-cost extension till 06/29/2016
Total award: \$997,883
- 2) National Institutes of Health - NIGMS
R15 Grant GM102995
PI: David Cummings
Title: Capture and Characterization of Self-Transmissible Plasmids from Urban Wetlands
Encoding Clinically Relevant Antibiotic Resistance Genes (PI: David Cummings)
05/01/13-04/30/16; 1-y no-cost extension expected
Total Award: \$ 237,790
Subcontract for UI (**Top**, Brown): \$65,646
Role: Co-investigator
- 3) M. J. Murdock Charitable Trust
PI: D. Stenkamp
Title: Acquisition of a Dynamic Imaging System
Total Award: \$142,500, to be matched with NIH funding (see 8)
Role: Co-PI
- 4) National Institutes of Health - SIG
1S10OD018044-01
PI: D. Stenkamp
Title: Acquisition of a Dynamic Imaging System
Total Award: \$455,032
Role: Co-PI
- 5) National Science Foundation
DBI-0939454
PI: E. Goodman (MSU)
Title: BEACON: an NSF Center for the Study of Evolution in Action
Title of collaborative project: Slow and steady wins the race? Adaptation in structured worlds.
8/1/12 to 7/31/13
Award: \$69,468 to **E. Top** '12-'13, extended to '14-'15
Role: Co-investigator – subcontract from MSU
- 6) National Institutes of Health - Center for Biomedical Research Excellence (COBRE) - Renewed
PI: Larry J. Forney; Project Directors: **E. Top**, S. Krone, C. Brown, Z. Abdo
Title: Center for Research on Processes in Evolution
Title Project I: Evolution of antibiotic resistance plasmid host range
02/01/2008 - 01/31/2013 (only till 01/31/2011 for E. Top)
Total award: ca. \$9.4 M; Total annual direct costs for E. Top and Z. Abdo in '10-'11: \$229,262
Role: Project Director Project I
- 7) National Institutes of Health – R01 Grant
PI: S. Krone; **co-PI: E. Top**
Title: Modeling the spatial dynamics of plasmid transfer

04/01/2005 to 03/31/2010, extended till 03/31/2011
Total award: \$1,276,027
Role: Co-PI

8) National Science Foundation – Microbial Genome Sequencing Program
PI: **E. Top**; co-PI: C. Brown
Title: The genetic diversity of broad-host-range plasmids in prokaryotes
11/01/2006 to 10/31/2008, extended till 10/31/2010
Total award: \$360,000
Role: PI

9) National Institutes of Health – National Institute for Allergy and Infectious Diseases NIH-FWD-IRN, contract no. N01-AI-30055,
PI: D. Call (WSU); Co-PIs: T. Besser, S. Broschat, and **E. Top**
Title: Epidemiology of antibiotic resistance plasmids
08/01/2007 – 07/31/2010
Total award: \$1,238,796; Subcontract to E. Top: \$75, 163
Role: Project leader on subcontract with WSU

10) Department of Energy (DOE) – Office of Biological and Environmental Research -
UA_Top_173_060602
PI: **E. Top**; co-investigators: C. Brown, L. Forney, J. Foster, J. Sullivan
Title: The genetic diversity of broad-host-range plasmids in prokaryotes
11/01/2005 – 06/08/2013
Award consists of determining the complete DNA sequence of 100 broad-host-range plasmids
(ca. 7Mb total) by the JGI at no cost.
Role: PI

Honors and Awards:

University of Idaho, Donald Crawford Graduate Faculty Mentoring Award

University of Idaho, Research and Creative Activity Excellence Award, April 2014

University of Idaho, College of Science Distinguished Professor, April 2013.

1989 Prize of the Alumni Society of Agricultural Engineers for academic achievement and community service (in Dutch: ‘de meest verdienstelijke student’; out of ca. 100 seniors, Ghent University, Belgium)

SERVICE:

Major Committee Assignments:

National (Belgium):

1999-2001: Member of the scientific committee "Genetically modified microorganisms - bacteria, and fungi", Belgian Biosafety Council (“Bioveiligheidsraad”).

University-wide and College:

2015-present: Member of the IBEST Steering Committee (IBEST: Institute for Bioinformatics and Evolutionary Studies; Director: Dr. J. Sullivan).

2012-present: Director of the BCB graduate program (Bioinformatics and Computational Biology).

- 2006-present: Member of the BCB graduate program (Bioinformatics and Computational Biology) Governing Board.
- 2008-2013: Chair of the Institutional Biosafety Committee (IBC) of the University of Idaho (and member since 2007).
- 2006-2010: Member of the College of Science Safety committee.
- 1998-2001: Chair of the Committee for Biosafety, Faculty of Agricultural and Applied Biological Sciences, Ghent University.
- 1995-1998: Secretary of the Committee for Biosafety, Faculty of Agricultural and Applied Biological Sciences, Ghent University.

University-Departmental/Program:

- 2015-present: Member of the Internal Advisory Committee of the NIH-COBRE funded Center for Modeling Complex Interactions (CMCI) (PI: Dr. H. Wichman).
- 2006-present: Member and chair (since '11) of the Randall Seminar Series Committee: Women in Science at the University of Idaho. The goal of this interdisciplinary seminar series is the academic enrichment of women in science.
- 2001-present: Member of the Graduate Affairs Committee, Department of Biological Sciences, University of Idaho.
- 2009-2013: Member of the Bioinformatics and Computation Biology Graduate Program Curriculum Committee
- 2005-2011: Chair of the Research and Education Infrastructure Committee, Department of Biological Sciences, and safety contact person for the department.

Contributions to Various UI Campus Events

- 2009: Luncheon Roundtable for female faculty to discuss barriers and process concerning promotion from Associate to Full Professor. One of three panel members
- 2007, 2008, 2012, 2013, 2014: Vandal Friday: one of the Biology faculty helping students sign up for classes for their first semester

Professional and Scholarly Organizations (including memberships, committee assignments, editorial services, offices held and dates)

Society office:

- 9/2012 – 10/2014: Secretary of the International Society for Plasmid Biology (ISPB)

Editorial Services and Grant Review:

Journals:

- 2008-present: Associate Editor for the journal Microbiology
- 2007-present: Associate Editor for the journal Plasmid
- 2011-present: Member of editorial board of the ISME Journal (Internat. Soc. for Microbial Ecology)
- 2005- 2011: Associate Editor for FEMS Microbiology Reviews
- 2000-2009: Member editorial board of Applied and Environmental Microbiology

Grant Review:

- 2011-present: Member of NIH study section GVE (Genetic Variation and Evolution, 3 meetings/y)
- 2010-present: Member of the expert panel 'BIO2: Functional Biology' of the Research Foundation

- Flanders (2 panels/year in Brussels, ~10-15 fellowship or grant proposals each)
- 2010-2011: Ad hoc member of NIH study section GVE (Genetic Variation and Evolution)
- 2007, 2008 Member of National Science Foundation (NSF) Grant Review Panel for Population and Evolutionary processes
- 2006 Member of National Science Foundation (NSF) Grant Review Panel for Microbial Interactions and Processes
- 2005: September 22-23: Member of grant review panel for the Finnish Academy of Sciences- Section Environmental Sciences, Helsinki, Finland
- 2004 Member of NSF Grant Review Panel for Biocomplexity in the Environment: Genome-Enabled Environmental Sciences and Engineering (GEN-EN)
- 2002 Member of NSF Grant Review Panel for Microbial Observatories

Ad hoc reviewer for journals: Genetics, Science, the ISME Journal, PLoS Pathogens, Journal of Bacteriology, FEMS Microbiology Ecology, FEMS Microbiology Letters, Environmental Science and Technology, Journal of Environmental Quality, Current Microbiology, Antonie Van Leeuwenhoek, Plant and Soil, Environmental Microbiology, Water Research, Biodegradation, Canadian Journal for Microbiology, ... (12-17/year total)

Ad hoc reviewer of grant proposals: NSF, NIH, and European funding agencies: 2-3/year

Professional Memberships:

American Society for Microbiology, International Society for Microbial Ecology, International Society for Plasmid Biology, Belgian Society for Microbiology, Dutch Society for Microbiology, Royal Flemish Engineer Society (KVIV).

Outreach Service: (Including popular press, interview articles, newspaper articles, workshops-seminars-tours organized, Extension impact statements)

- 2007-2010: Developed a website entitled 'The Virtual Genome Project' in collaboration with faculty in Art and Design and their students.
- 2008: Trained one Native American high school student in laboratory research methods related to the diversity of antibiotic resistance plasmid

Organization of symposia and sessions within symposia:

- 2015: Vice-chair of the Gordon Conference 'Microbial Population Biology' (with Dr. L.J. Forney)
- 2006: Co-organizer and chair of the session 'Ecology and Evolution of Plasmids' at the International Symposium for Plasmid Biology, September 23-27, South Lake Tahoe, CA.
- 2003: Member of the organizing committee and session chair of the North West Branch Meeting of the American Society for Microbiology (ASM), University of British Columbia, Vancouver, August 7-10
- 1998-2001: Deputy Delegate for Belgium of the COST Action 831: 'Biotechnology of soil: monitoring, conservation and remediation', and vice-chairperson of Working Group 3: 'Molecular Biology applied to Soil Microbial Communities'
- 1998-2001: Member of two EU-BIOTECH concerted actions (Framework IV) 1) "Mobile elements' contribution to bacterial adaptability and diversity" (MECBAD); 2) "Marker genes as tags for monitoring microorganisms in nature" (MAREP).

- 1997-2001: Member of the board 'Biotechnology' of the Royal Flemish Engineer Society (KVIV), organized workshops and courses in the broad area of biotechnology
- 1997-1998: Chair of the 12th Forum for Applied Biotechnology (FAB), organized yearly by the Faculty of Agricultural and Applied Biological Sciences, Ghent University, and the Regional Development Authority of West-Flanders, Belgium. Brugge, Belgium, September 24-25, 1998
- 1996-1997: Vice-chair of the 11th Forum for Applied Biotechnology (FAB), Ghent, Belgium, September 23-24, 1997.
- 1995-1997: Member of the organizing committee of the Third International Symposium on Environmental Biotechnology (ISEB-3), Ostend, April 24-27, 1997.
- 1991-2001: Member of the organizing committee of the Forum for Applied Biotechnology (FAB), Ghent University, Belgium.
- 1990-1991: Assistant to the chair of the Forum for Applied Biotechnology (FAB), Ghent, Belgium (Representative of the 'Scientific Center').

PROFESSIONAL DEVELOPMENT: (workshops and seminars attended)

Teaching:

Two-day workshop on teaching methods for Assistant Professors, Ghent University, Spring 1999.

Scholarship:

1. Grant Writing Workshop: How to write award-winning NIH grants. August 12-13, University Inn-Best Western, Moscow, Idaho (organized by BRIN)
2. Writing Competitive Proposals, by Sarah Koerber, University of Idaho, Spring 2006.
3. Various lectures on grant writing and leadership at NIH-NISBRE meetings (DC, 2008 and 2010)

Administration/Management:

2006 Applying Sound Research Administration decisions, July 11, 2006. University of Idaho.