

# Manuel Middendorf

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## Education & Honors

<b>Columbia University, Grad. School of Arts and Sciences, Physics Dept.,</b>	<b>New York, NY</b>
PhD, "Using machine learning to predict and analyze biological networks", (Advisor: Prof. Chris H. Wiggins)	Expected Oct 2005
M.Phil., Physics, GPA 3.9	May 2004
M.A., Physics	May 2003
<b>Technical University, Physics Department</b>	<b>Berlin, Germany</b>
B.S. equivalent, Physics/Mathematics	July 2001
<b>Studienstiftung des Deutschen Volkes Fellow</b>	<b>Berlin, Germany</b>
Award for academic excellence and social responsibility	2001-2004

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## Research Experience

<b>Graduate Research Assistant, Columbia University</b>	<b>New York, NY</b>
• Performed research, published papers, and presented conference talks on using machine learning and information theory to predict gene-regulatory and protein interaction networks from microarray data, sequence data, functional annotation data, and various high-throughput experimental data. Collaborated with computer scientists, applied mathematicians, and biologists in teams of 4-8 people. (Advisor: Prof. Chris H. Wiggins)	May 2003 - Present
• Performed research and developed algorithms on Monte-Carlo simulations for small-world network models. (Advisor: Prof. Timothy Halpin-Healy)	Spring 2003
• Performed research on predicting temperature-dependent magnetization for ferromagnets near quantum-criticality. (Advisor: Prof. Andrew Millis)	Summer 2002

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## Leadership/Teaching Experience

- Five 1-week leadership trainings with the Young Earth Human Alliance, Sedona, AZ, and Humanity's Team, New York, NY, developing confidence, determination, clarity for one's vision, presentation/performance skills, and social skills. 2004-2005
  - Physics lab Teaching Assistant, Columbia University, New York, NY 2001-2003
  - Physics Tutor (ca. 10 high-school/undergraduate students), Berlin, Germany, and New York, NY 1998-2004
  - Violin Player, soloist, concert master, conductor, Berlin/New York 1990-2004
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## Skills

- **Operating Systems:** UNIX, Linux, Windows 98/NT/XP, Mac OS X
  - **Programming Languages:** MATLAB, Perl, C/C++, Java, Mathematica, SAS
  - **Languages:** fluent (oral/written) in German, English, French; basic skills in Korean
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## Publications

- M. Middendorf, A. Kundaje, M. Shah, Y. Freund, C. Wiggins, and C. Leslie, *Motif discovery through predictive modeling of gene regulation*, Proceedings of the 9th Annual International Conference on Research in Computational Molecular Biology (RECOMB), 2005.

- E. Ziv, M. Middendorf, and C. Wiggins, *Information-theoretic approach to network modularity*, Physical Review E **71**, 046117, 2005.
- E. Ziv, R. Koytcheff, M. Middendorf, and C. Wiggins, *Systematic identification of statistically significant network measures*, Physical Review E **71**, 016110, 2005.
- A. Kundaje, M. Middendorf, C. Wiggins, and C. Leslie, *Combining sequence and time series expression data to learn transcriptional modules*, IEEE Transactions on Computational Biology and Bioinformatics, 2005. In press.
- M. Middendorf, E. Ziv, and C. Wiggins, *Inferring network mechanisms: The Drosophila melanogaster protein interaction network*, Proceedings of the National Academy of Sciences, **102**, 9, 2005.
- M. Middendorf, E. Ziv, C. Adams, J. Hom, R. Koytcheff, C. Levovitz, G. Woods, L. Chen, and C. Wiggins, *Discriminative topological features reveal biological network mechanisms*, BMC Bioinformatics, **5**, 2004.
- M. Middendorf, A. Kundaje, C. Wiggins, Y. Freund, and C. Leslie, *Predicting genetic regulatory response using classification: Yeast stress response*, Proceedings of the First Annual RECOMB Regulation Workshop, 2004.
- M. Middendorf, A. Kundaje, C. Wiggins, Y. Freund, and C. Leslie, *Predicting genetic regulatory response using classification*, Bioinformatics, **20**, 2004, Proceedings of the Twelfth International Conference on Intelligent Systems for Molecular Biology (ISMB 2004).

## Conference Presentations

- 9th Annual International Conference on Research in Computational Molecular Biology (RECOMB) Boston, MA, 2005
- American Physical Society March Meeting '05 Los Angeles, CA, 2005
- Center for Computational Biology and Bioinformatics retreat, Columbia University New York, NY, 2004
- 12th International Conference on Intelligent Systems for Molecular Biology (ISMB) Glasgow, UK, 2004
- American Physical Society March Meeting '04 Montreal, Canada, 2004
- International Conference on Complex Systems Boston, MA, 2004
- 90th Statistical Mechanics Conference, Rutgers University New Brunswick, NJ, 2003