

Evaluation of the Junior Nanotech Network Illinois Program July 11-31, 2010

**CENTER FOR THE PHYSICS OF LIVING CELLS (CPLC)
University of Illinois at Urbana-Champaign (UIUC)**

Questionnaire, Evaluation, and Report by Jaya Yodh, CPLC Director of Education and Outreach

In 2010, the Center for the Physics of Living Cells (CPLC) at The University of Illinois (UIUC) participated in a self-organized PhD students International exchange program called the **Junior Nanotech Network 2010 (JNN)** with the **Center for NanoScience (CeNS)** at **Ludwing-Maximilians-University Munich (LMU-Munich)**. The 2010 scientific organizers included **Taekjip Ha & Klaus Schulten** from **UIUC/CPLC** and **Philip Tinnefeld & Jens Michaelis** from **LMU Munich/CeNS**. The program coordinators were **Jaya Yodh (CPLC)** and **Marie-Christine Bluem (CeNS)**. The JNN promotes global scientific and intercultural exchange between graduate students in the fields of nanoscience, experimental and computational biophysics. For the program between CPLC/UIUC and CeNS (LMU-Munich) eight University of Illinois graduate students served as scientific and housing hosts for nine CeNS PhD students from July 11-31, 2010, while the German student group reciprocally hosted the UIUC students for a three week European visit in September. The programs in both locations involved three elements: 1) hands-on experimental/computational training by their host peers 2) conference/poster sessions, and 3) cultural exchange.

During their three week stay at the University of Illinois, the visiting CeNS students received scientific training by their host peers in four major areas – single-molecule FRET, optical trapping, fluorescence-force spectroscopy, and computational biophysics. They also participated in the **2010 CPLC Physics of Living Cells Summer School** as well as the **1st Annual Midwest Single Molecule Meeting in St. Louis, MO**. They experienced numerous recreational and cultural activities across the Midwest including trips to Chicago and St. Louis.

After the Illinois portion of the JNN program was completed, the nine participants were asked to complete an evaluation comprising two types of questions: 1) General Evaluation questions focused on the educational components of the program, overall outcome & satisfaction, peer training sessions, summer school integration, Midwest Single-Molecule Meeting, environment & resources, communication & dissemination, and suggestions for improvement; and 2) Specific Evaluation questions focused on individual components such as each peer training station. A condensed version of the results is provided below divided into the following sections:

- I. Outcome (*General only*)
 - I. Peer Training Sessions (*General and Specific*)
 - II. Summer School Integration (*General Only*)
 - III. Midwest Single-Molecule Meeting in St. Louis (*GeneralOnly*)
 - IV. Environment and Technical Resources (*General only*)
 - V. Communication and Dissemination (*General only*)
 - VI. Overall Satisfaction (*General only*)
 - VII. Suggestions for Improving student exchange program (*General only*)

Summaries for each section are comprised of up to three elements: 1) **'Participant Agreement'**: The proportion of respondents either agreeing with statement listed in the General Evaluation or rating the component listed in the Specific Evaluation as 'Highly Relevant', 2) Selected written comments representing respondent opinion, and 3) Text summarizing the main points of the total body of comments for a particular section. The **'Participant Agreement'** with a statement listed in the General Evaluation is calculated by summing the 'Agree' and 'Strongly Agree' percentages from the tables below. For example, in the first item of Table I below, 'Participant Agreement' is calculated at 100% (33% 'Agree' + 67% 'Strongly Agree'). Another parameter referred to in the summary is the proportion of respondents offering a **'Highly Relevant'** rating for a topic (e.g. lecture) listed in the Specific Evaluation. This is calculated by summing the 'Very Good' + 'Excellent' percentages from the tables. For example, in the first item (station A) of Table IIb below, the 'Highly Relevant' rating is calculated at 100% (33% 'Very Good' + 67% 'Excellent'). The number of participants responding to a question is indicated by '**N**' count for each item in the table. Note that the 'Total Possible N' is also listed in the left side of each table. For the 2010 JNN Illinois program, the total possible N = 9 for all events. For almost all questions, all 9 respondents filled out the evaluation so the average response rate for the evaluation items at 100%. The total number of written comments '**C**' is also listed for each section and from these a few representative comments were provided.

I. Outcomes (General Evaluation): With respect to outcomes, all participants (100%) indicated the JNN-IL program broadened their understanding of single-molecule/ live-cell experimental and computational biophysics and was a positive academic and also social/cultural experience. Nearly all (89%) thought the program improved their ability to carry out original research in the above fields, and most (78%) thought they were taught techniques directly applicable to their career. N= total number of respondents, C= total number of comments; % Agreement = % Agree + % Strongly Agree)

I. OUTCOME (General Evaluation)	Scale					
	N	Strongly disagree	Disagree	Unsure	Agree,	Strongly agree
<i>Total Possible N = 9</i>						
1. The JNN Illinois Program broadened my understanding of concepts and principles in the field of Single-Molecule and Live-Cell Experimental Biophysics and Computational Biophysics	9				33.3%	66.7%
2. The JNN Illinois Program improved my ability to carry out original research in the field of Single-Molecule and Live-Cell Experimental Biophysics <u>and/or</u> Computational Biophysics.	9			11.1%	33.3%	55.6%
3. The JNN Illinois Program taught me skills and techniques directly applicable to my career	9			18.2%	55.6%	22.2%
4. The JNN Illinois Program provided a positive academic learning experience.	9					100%
5. The JNN Illinois Program provided a positive social and cultural experience.	9				11.1%	88.9%

Ila. Peer Training Sessions General Evaluation): The peer training sessions offered by the Illinois hosts in the JNN program were generally highly regarded. All respondents (100%) agreed that the instructor's had high level of subject knowledge, explained the material well, and provided sufficient handouts; that the training sessions were of appropriate level and length, and had adequate lab facilities. Nearly all (89%) felt the training improved their experimental and computational skills and the instructors were prepared to answer questions. Fewer (77%) said that instructors stimulated their intellectual curiosity. (N= total number of respondents, C= total number of comments; % Agreement = % Agree + % Strongly Agree)

Ila. Peer Training Sessions (two-day courses by hosts) (General Evaluation)	Scale					
	N	Strongly disagree	Disagree	Unsure	Agree,	Strongly agree
<i>Total Possible N = 9, C=0</i>						
1. The training sessions improved my experimental <u>and/or</u> computational skills.	9			11.1%	66.7%	22.2%
2. The instructors' knowledge of the subjects was high.	9				11.1%	88.9%
3. The instructors explained the material and techniques well.	9					100%

4. The instructors were well-prepared to answer questions.	9			11.1%		88.9%
5. The training session handouts provided sufficient instructions to proceed with the hands-on assignments.	9				44.4%	55.6%
6. The training session laboratory <u>and/or</u> computer stations were adequate for instruction.	9				11.1%	88.9%
7. The training sessions were of sufficient length.	9				11.1%	88.9%
8. The level of the training sessions was appropriate.	9				11.1%	88.9%
9. The instructors stimulated my intellectual curiosity.	8			11.1%		77.8%

IIb. Peer Training Session (Specific Evaluations): All nine students rotated through all the peer training sessions. All respondents (100%) rated the peer training sessions as highly relevant. (N= total number of respondents, C= total number of comments; % High Relevance = % Very Good + % Excellent)

Sample Comments (Specific)

Station A: Theory (TAs: Rogan Carr (Aksimentiev Lab), Chaitnaye Sathe (Schulten Lab), and Johan Strumpfer (Schulten Lab))

- “Great introduction into the field of molecular simulations. Hands-on work nicely demonstrated the power of the models.”

Station B: smFRET/SimPull/PIFE (TAs: Jeehae Park (Ha Lab), Ankur Jain (Ha Lab), Helen Hwang (Myong Lab))

- “The laboratory procedures were clear and transparent and organized material that was discussed previously. Each module had a measurable goal that was achieved within the time allotted.”

Station C: Fleezers: Single-molecule fluorescence combined with optical trapping (TA: Kyung Suk Lee – Ha Lab)

- “Impressive system for a two-day workshop. Very nice handout.”

Station D: Optical Trapping: Single-molecule fluorescence combined with optical trapping (TA: Markita Landry – Chemla Lab)

- “This was a well-organized session that proceeded from start to finish along clear lines of explanation and comprehension. I can’t wait to read the paper!”

IIb. Peer Training Sessions (specific evaluation)	Scale					
	N	Poor	Fair	Good	Very Good	Excellent
Station A: Theory (TAs: Rogan Carr (Aksimentiev Lab), Chaitnaye Sathe (Schulten Lab), and Johan Strumpfer (Schulten Lab)) (Total Possible N = 9; C=4)	9				33.3%	66.7%
Station B: smFRET/SimPull/PIFE (TAs: Jeehae Park (Ha Lab), Ankur Jain (Ha Lab), Helen Hwang (Myong Lab)) (Total Possible N = 9; C=6)	9				11.1%	88.9%
Station C: Fleezers: Single-molecule fluorescence combined with optical trapping (Kyung Suk Lee – Ha Lab) (Total Possible N = 9; C=4)	9				11.1%	88.9%

Station D: Optical Trapping: Single-molecule fluorescence combined with optical trapping (Markita Landry – Chemla Lab) (Total Possible N = 9; C=3)	9					100%
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III. Summer School Integration (General Evaluation): The JNN students from Germany attended the CPLC Summer School as part of their exchange program. They did not apply so CPLC actually assigned them to the advanced modules in order to expose them to techniques they were not learning in the peer training sessions nor in their own research. Consequently, they were not coming with the same motivations as the other students into the advanced module. They also presented a poster during the Summer School unlike the other summer school students. Most (89%) agreed that the Summer School provided a useful overall learning experience and were satisfied with their advance module assignment. However, only 77% agreed that their participation in the poster session proved useful for their learning process and research feedback. (N= total number of respondents, C= total number of comments; % Agreement = % Agree + % Strongly Agree)

Sample Comment: "I certainly gained exposure to new techniques. I thought the poster session was the best way to ensure that each member of the JNN had the opportunity to fully engage their fellow participants in their respective research projects (I think it could have been longer actually). Finally integrating the summer school was an excellent idea – it would have been difficult to get the Illinois members to fill 3 weeks of sessions on their own, and this provided an additional avenue of networking and discussion."

III. Summer School Integration (General Evaluation)	Scale					
	N	Strongly disagree	Disagree	Unsure	Agree,	Strongly agree
<i>Total Possible N = 9, C=3</i>						
1. Integrating the Summer School into the JNN Illinois Exchange Program was useful in terms of my overall learning experience.	9			11.1%		88.9%
2. Participation in the CPLC Summer School Poster Session was useful in terms of my learning process and getting feedback on my research	9			22.2%	33.3%	44.4%
3. The assignment to summer school advanced modules was satisfactory. (Note - JNN advanced module assignments were made in order to maximize their exposure to new techniques (so unrelated to their own research and not overlapping with the UIUC peer training sessions))	9		11.1%		33.3%	55.6%

IV. Midwest Single-Molecule Meeting (General Evaluation): During the JNN Illinois program, the entire JNN group (Illinois and German students) attended the 1st Annual Midwest Single-Molecule Meeting at Washington University in St. Louis, MO from July 25-27, 2010. This program involved research seminars by leading single-molecule experimentalists in the region and a poster session. In addition, the students did some touring of St. Louis. All (100%) of the German student group agreed that the meeting increased their understanding of the field and stimulated their intellectual curiosity. Nearly all (89%) thought the meeting was relevant to the overall training during the JNN Illinois program. However, only 66% felt this meeting was relevant to their research. (N= total number of respondents, C= total number of comments; % Agreement = % Agree + % Strongly Agree)

Sample Comment: "The presentations were very interesting for people working with force techniques. There could have been more presentations based on single-molecule fluorescence techniques and maybe more biological questions."

IV. Midwest Single-Molecule Meeting – General Evaluation	Scale					
<i>Total Possible N = 9, C=2</i>	N	Strongly disagree	Disagree	Unsure	Agree,	Strongly agree
1. The meeting was relevant to the overall training I received during this exchange program.	9		11.1%		22.2%	66.7%
2. The meeting increased my understanding of the field.	9				44.4%	55.6%
3. The meeting was relevant to my research.	9		11.1%	18.2%	33.3%	33.3%
4. The meeting stimulated my intellectual curiosity.	9				33.3%	66.7%

V. Environment and Technical Resources (General Evaluation): All (100%) of JNN German students agreed that the peer training stations (laboratory/computer facilities) were conducive to learning, the housing accommodations were adequate, and were satisfied with social component of the program. However only 66% agreed that the meals were adequate. (N= total number of respondents, C= total number of comments; % Agreement = % Agree + % Strongly Agree)

Sample Comment: “Everything in this regard was highly satisfactory”

V. ENVIRONMENT & TECHNICAL RESOURCES (General Evaluation)	Scale					
<i>Total Possible N = 9</i> <i>C=1</i>	N	Strongly disagree	Disagree	Unsure	Agree,	Strongly agree
1. The lecture, laboratory and desk/computer work spaces provided for your peer training sessions were conducive to learning (Loomis Ha Lab; Loomis Chemla Lab; DCL Myong Lab; Beckman Schulten lab)	9				22.2%	77.8%
2. The housing accommodations during the JNN three-week program UIUC were adequate.	9				22.2%	77.8%
3. The meals provided during the JNN three-week program at UIUC were adequate.	8			22.2%	11.1%	55.6%
4. The recreational/social aspects of the JNN three week program were satisfactory (Champaign-Urbana, Chicago, and St. Louis)	9				11.1%	88.9%

VII. Communication and Dissemination (General Evaluation): This aspect of the Summer School was rated very highly with 100% of the participants agreeing that the administrative staff provided sufficient information prior to the event, were available and helpful throughout the Illinois program; and that their UIUC hosts were available and helpful in both scientific training and non-science aspects of the program. (N= total number of respondents, C= total number of comments; % Agreement = % Agree + % Strongly Agree)

Sample Comments: "The hosts were very gracious and accommodating. Administrative staff were very helpful. Everyone's efforts were much appreciated."

VI. COMMUNICATION & DISSEMINATION (General Evaluation)	Scale					
	N	Strongly disagree	Disagree	Unsure	Agree,	Strongly agree
<i>Total Possible N = 9, C=1</i>						
1. The CPLC Administrative Staff provided sufficient information <u>prior</u> to the event	9				22.2%	77.8%
2. The CPLC Administrative Staff were available and helpful <u>during</u> the JNN Illinois Program.	9					100%
3. Your UIUC hosts were readily available and helpful in answering scientific questions during their peer training sessions.	9					100%
4. Your UIUC hosts were readily available and helpful in answering questions pertaining to housing, social, and recreational activities.	9				11.1%	88.9%

VII. Overall Satisfaction (General Evaluation): Overall satisfaction rating was high with all of the respondents (100%) agreeing that the JNN Illinois program was well organized, achieved a good balance between peer training sessions and Summer School, addressed individual research needs, and met individual overall expectations. Nearly all (88%) thought that the balance between the academic training and recreational/cultural events was optimal. (N= total number of respondents, C= total number of comments; % Agreement = % Agree + % Strongly Agree)

Sample Comments

- "The JNN provided a variety of new avenues for research that I was not previously able to fully appreciate. It also provided a network of the right people to ask about questions on a given field, should I have such a need in the future."
- "Very interesting and relevant projects. It has been a very intense time regarding science and culture. I am very satisfied!"

VII. OVERALL SATISFACTION (General Evaluation)	Scale					
<i>Total Possible N = 9, C=3</i>	N	Strongly disagree	Disagree	Unsure	Agree,	Strongly agree
1. The JNN Illinois Program was well organized.	9					100%
2. The balance between the peer training sessions and CPLC Summer School during the JNN Illinois Program was optimal.	9				33.3%	66.7%
3. The JNN Illinois Program addressed my research needs.	9				33.3%	66.7%
4. The balance between the academic training and recreational/cultural events during the JNN Illinois Program was optimal.	9			11.1%	11.1%	77.8%
5. Overall, the JNN Illinois Program met my expectations.	9				11.1%	88.9%

VIII. Suggestions for Improving the Illinois Student Exchange Program. The main suggestions put forth had to do with assignments to advanced modules in the summer school and scheduling of recreational activities.

Sample Comments:

- “More freedom in choosing the advanced module (in my case I was happy)”
- “A concrete schedule for the evening activities would have been very useful. There were a lot of proposals for activities but also a lot of discussions lasting for hours because of disagreement in such a big group.”

IX. Other Final Comments:

- “Thanks very much for all your hard work and organization! The program was an excellent professional and personal experience.”
- “Keep this program alive! Thank you very much for letting me participate in this great international program!”