**Interdisciplinary Graduate Program (IDGP) in Human Toxicology**

**Graduate Degree Program Strategic Assessment – Narrative – Prepared for the “Task Force on Graduate Education: Selective Excellence”**

The Mission of the IDGP in Human Toxicology is to foster among the faculty and students of the new Interdisciplinary Graduate Program in Human Toxicology a culture of exceptional expertise, uninhibited interdisciplinary cooperation, excellent communication within and to the outside community, a high level of energy and the determination to achieve these goals; all characteristics that will enable us to train outstanding toxicologists for the future.

**Goals of the IDGP in Human Toxicology:** To train the highest caliber scientists, we provide graduate students and post-docs with exceptional didactic instruction and state-of-the-art laboratory training in order to provide a solid foundation for their scientific work. We expose them to peers, mentors, and first class experts in their field who will provide an open-minded attitude, access to a network of colleagues, and the fearlessness to fulfill the leadership role that is awaiting them.

**Administrative Process and Criteria:**

**Student Demand and Recruitment**

The new IDGP in Human Toxicology under the leadership of Dr. Robertson was approved by the Iowa Board of Regents in 2006 and was launched in January 2007 with the participation of 16 faculty and strong support from the Dean of the Graduate College, Dr. John Keller. Although now only in its third year of student recruitment the number of applications has grown from 8 in 2007 to 22 in 2008 and 33 in 2009. The number of students in the program has increased from 3 who transferred from other programs as soon as the IDGP in Human Toxicology was established in the Spring 2007 to 18 by the Fall semester of 2009, 17 of whom are doctoral students.

<table>
<thead>
<tr>
<th>Academic year</th>
<th>Student applications</th>
<th>Admitted (%)</th>
<th># of graduate students in program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Established Spring 2007</td>
<td>3 (transferred)</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>2007/8</td>
<td>8</td>
<td>5 (62%)</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&amp; 1 transfer &amp; 1 MS (Chemistry Ph.D. student) &amp; 1 continuation*</td>
<td></td>
</tr>
<tr>
<td>2008/9</td>
<td>22</td>
<td>5 (23%)</td>
<td>16</td>
</tr>
<tr>
<td>2009/10</td>
<td>33</td>
<td>4 (12%)</td>
<td>18**</td>
</tr>
</tbody>
</table>

* One student joined the IDGP in Human Toxicology doctoral program after obtaining a MS in OEH.
** Two students graduated this Summer (2009).


**Criteria for Selection**

As stated on the IDGP in Human Toxicology application web-site, the criteria for the selection of students who are likely to be successful in the Program include:
1. A minimum undergraduate GPA higher than 3.0, or the demonstration of success in graduate work, in fields of study within the scientific disciplines, such as chemistry, biology, physics, engineering and the health-related disciplines;
2. A minimum GRE score of 1100 (sum of the first two parts);
3. For international applicants, a minimum TOEFL of 600 (paper), 250 (computer), or 100 (Internet based).
4. At least three letters of reference that reflect positively on the potential of the candidate for success in graduate studies.

Generally successful applicants will have attained a Bachelor’s or Master’s degree in the sciences or engineering, and are well prepared to successfully negotiate the Program curriculum.

All applicants fill out the free pre-application documenting their previous training, GPA, GRE, a statement of purpose, a statement of extracurricular activities, a description of laboratory research experience, if any, and 3 letters of recommendation. Every member of the Admission Committee (5 faculty members representing 3 different Colleges) has access to the documents of every applicant through a dedicated and password-protected web-site. The DGS calls a meeting of the Admission Committee where all applications are discussed and promising candidates are chosen to be invited to visit UI on one of two possible dates. Visiting students have a full day meeting with faculty members of their choice, faculty members who wish to meet them, as well as students and post-docs. Every faculty member who interviewed a visiting student writes a report which is added to the application. After the visits, the Admission Committee meets again and discusses all candidates. Candidates are ranked and voted on. The DGS is charged to contact the chosen candidates and invite them to submit an official application. Students who accept the offer are officially admitted.

Even though the IDGP in Human Toxicology is very young, it already has attracted outstanding students. Current students are described and depicted on the web at http://toxicology.grad.uiowa.edu/students.

Success in Enrolling the Highest Qualified Students Admitted

Graduate students who have joined the IDGP in Human Toxicology are excellent students, are highly motivated, and exhibit independent thinking. The high quality of our students is evidenced by the fact that 2 of 17 obtained prestigious and highly competitive UI Graduate Presidential Fellowships. In addition, 2 other students wrote pilot grant applications that were funded, and our students earned at least 5 awards for their poster and oral presentations at scientific meetings. These awards have had a positive effect not only on the recipient, but also on all other students, who are now very eager to follow in those footsteps. This high number of awards and recognition in such a young program is truly remarkable and can only be explained by the forward looking attitude of every member.

Success in Enrolling a Diverse Student Cohort

The field of Toxicology is highly diverse, interdisciplinary, and multi-faceted. This is reflected in the group of researchers that work on toxicological problems and in the diversity of students and post-docs within the IDGP in Human Toxicology. Students of the IDGP in Human Toxicology have most often Bachelor’s degrees in chemistry, biology, or related disciplines and very often already an MS degree in an area like environmental health. At this point in time, about half of our students are female; one is a minority. The current students in our program represent the US and 7 foreign countries (China, Germany, India, Korea (South), Nepal, Netherlands, Thailand).

What are the Financial Aid Commitments Made to Incoming and Continuing Graduate Students?

All doctoral students offered admission to the IDGP in Human Toxicology are offered recurring financial aid, consisting of a Biosciences level stipend and fees and tuition, as long as progress is made toward the degree.
Program Outcomes:

**Degree completion and time-to-degree**

All 18 doctoral students of the IDGP in Human Toxicology are fully supported. Two students graduated in 2009, representing the first graduates in our program.

**Graduate student fellowships, awards, honors, and/or publications**

As mentioned, two of our current doctoral students were awarded prestigious UI Graduate Presidential Fellowships, one student was awarded funding of his pilot grant proposal from CHEEC (Center for Health Effects of Environmental Contaminants), and another student was awarded funding of her pilot grant from the EHSRC.

Our students have already earned at least 5 awards for their poster and oral presentations at scientific meetings, including the regional SOT meetings (Central State Chapter of the SOT), at the annual SOT meeting, and at the annual Superfund meeting. One reason for this impressive success of our students is that they are strongly encouraged to present their work at local, regional, national and international meetings with financial help covering all registration, travel, and lodging costs being provided from various sources.

It is expected that a doctoral student will have about 3-5 peer reviewed publications from his/her Ph.D. research, where the student is usually the first author.

**Graduate Student Placement**

One graduate is a post-doc in another program at UI. The other graduate was offered a position in a not-for-profit organization (information whether she accepted is not available at this moment).

Program Characteristics:

**What is the appropriate size?**

The future of the IDGP in Human Toxicology appears bright. There is a great need for the skills and expertise of our highly trained graduates. So far we have been able to place all of our rotating first year students into laboratories and have not as yet reached our carrying capacity. Likewise we anticipate no shortage of jobs for our graduating Ph.D.’s.

The number of faculty members who are affiliated with the program also continues to grow and has now reached 22, with 2 new applications for membership expected during the Fall semester. This growth has increased the options for research training and mentors for the students and post-doctoral trainees.

**How does the program compare with other similar programs?**

It is too early to compare our young program with others nationally. It is however fair to say that the UI program is a toxicology program with considerable intensity and breadth. Not surprisingly, the UI program displays vigor, growth, and provides the opportunity to do it right by avoiding problems that surfaced in older programs.

**Provide a brief candid analysis of the current strengths and weaknesses of the graduate degree program**

Three important aspects of strength should be pointed out: 1. The very significant and important support through the Graduate College and Dean Keller; 2. The huge interest and enthusiastic support and appreciation for our program from our colleagues throughout UI, resulting in a steady increase in participating faculty members from different departments at UI and thereby large choice of research topics for our students; 3. The existence of an interdisciplinary Superfund Basic Research Program Grant. The Superfund research into the occurrence, effects, and remediation of semi-volatile polychlorinated biphenyls (PCBs) brings together 22 faculty from 6 different departments and 4
colleges, and provides an interdisciplinary research area and is an important source of financial support for many of our students.

A weakness of the program is the lack of a part time staff position, lack of appreciation of the additional administrative efforts and work of its faculty, and the dependence on R01-type funding for the long-term support of the students.

**Discuss opportunities for potential growth**

One important next step is to obtain a Training grant in Human Toxicology. Such a training grant would allow the program to offer secure financial fellowships to US students for up to 5 years. Current financial support after the first year completely depends on external research grants of the individual mentors which may or may not last long enough. A Training Grant would provide stability and at the same time prestige and visibility. To achieve this goal, the faculty submitted a T32 to NIEHS which will be reviewed later this year.

**Conclusions:**

During the short life time of the IDGP in Human Toxicology, the program has grown quickly, aided by the support of the Graduate College and by excellent research centers (The Environmental Health Sciences Research Center, EHSRC, and the Superfund Basic Research Program, isbrp, to name two) strongly supporting the research efforts of our students. We anticipate continued success in the training of our students and ultimately their considerable professional contributions as toxicologists in government, industry and academia.