INTERIM REPORT
OPTN/UNOS HISTOCOMPATABILITY COMMITTEE

Teleconference
February 22, 2007
1:00-4:00 (EST)

- M. Sue Leffell, Ph.D., Committee chair, opened the meeting by introducing. Rob Kochik, B.S.N., RN, from the Finger Lakes Donor Recovery Network, who will be replacing Alista Watkins as the at large OPO representative. Wida Cherikh, Ph.D., announced she would no longer be the UNOS research liaison for the Committee, and introduced Ann Harper from the UNOS Research Department, who will be fulfilling that role.

- Report from the Board of Directors, December 13-14, 2006. Dr. Leffell gave a brief report on key items from the Histocompatibility Committee approved by the Board at its December 2006 meeting.

  Dr. Leffell reported that after a brief discussion the Board approved modifications to Policy 3.5.11.3 (Panel Reactive Antibody). This will replace PRA with a Calculated PRA (CPRA), defined as the percentage of incompatible donors (i.e., donors expected to have one or more of the unacceptable antigens indicated on the Waiting List for the candidate).

  She also noted that three action items from the Histocompatibility Committee were placed on the consent agenda and approved. They were:
  - The "Best Practice Guidelines" that reflect the consensus of the Committee regarding state-of-the-art practices for histocompatibility (HLA) laboratories. These recommendations will serve the patients' best interest and help OPTN/UNOS achieve its goals of expediting organ placement and minimizing organ waste. The "Best Practice Guidelines" can be viewed on the OPTN website.
  - The distribution of a white paper entitled "Specimens for Histocompatibility Testing – Guidelines for OPOs." The document is intended to provide information and guidelines for OPOs on the types of specimens that should be collected for histocompatibility testing, how to handle the specimens to maintain maximum quality, and the amount of materials that is needed by the laboratory. The Committee intends that this document be published in the form of a pamphlet to be distributed to all HLA laboratories as a reference tool.
  - Modifications to Appendix 3A – HLA A, B and DR Antigen Values and Split Equivalences Table.

- Membership Issues and Report from the Membership and Professional Standards Committee (MPSC). The full Committee approved the recommendations regarding key personnel changes in UNOS-approved HLA laboratories made by the Committee's Membership subcommittee on a conference call held on January 11, 2007. Geof Land Ph.D., had presented these recommendations to the MPSC on January 30, 2007.
  (Committee Vote: 15 for, 0 against, 1 abstentions)

  The Committee expressed concern about the number of laboratories that one person could direct. Current guidelines limit that number to five; however, the Committee expressed doubts that one individual could realistically oversee the workings of five individual laboratories. The Committee agreed to look further into this situation at a future meeting.

- Report from the Minority Affairs Committee (MAC). Steven Geier Ph.D., reported he will be attending the MAC meeting as the Histocompatibility representative on February 23, 2007. Dr. Geier said the MAC is very interested in the work of the Committee and the impact it will have on minorities. He said the MAC tends to be supportive of the proposals from the Committee, but they want to review the data to ensure that no minority will be disenfranchised.

Dr. Geier mentioned a study Dr. Cherikh presented at the previous MAC meeting reporting the results of placing A_2 kidneys into B recipients. The study found that in areas where B recipients appeared on the match run for an A_2 donor, slightly fewer transplants took place in Caucasian recipients and a higher number of minority candidates, especially African Americans, were transplanted. Graft survival did not appear to be affected by this change. Dr. Geier reported that the MAC is also concerned about the absence of a minority voice in the public comment arena and in the changes to kidney allocation that are being considered by the Kidney Committee.

- Report from Operations Committee. Dr. Land reported that the Regions working with DonorNet® 2007 are pleased with the results and there have been no major problems. He encouraged Committee members to take advantage of the training exercises that are currently posted on UNet℠.

- Report from Kidney and Pancreas Transplantation Committees. The Kidney Committee sponsored a public forum on February 8, 2007 to solicit responses from members of the transplant community and the general public regarding policy concepts under consideration for the new kidney allocation system. The Kidney Committee then met on February 9, 2007 to discuss the forum. Mike Cecka, the Histocompatibility Committee vice-chair, attended the public forum and the following Kidney Committee meeting. Dr. Leffell attended the Kidney Committee meeting by conference call.
  Dr. Cecka reported that public representation at the forum included physicians, transplant coordinators, financial managers, OPO personnel, scientists, transplant recipients and candidates. He said that the morning sessions summarized the charge to the Kidney Committee, the modeling methods used by the Scientific Registry of Transplant Recipients (SRTR), the results from simulations run from these models, and ethical considerations of a "LYFT"- based kidney allocation system. The term "life years from transplant," or LYFT, is now being used to describe the net benefit concept. He noted there has been some pressure from those attending the forum to modify the sole use of "benefit" in a LYFT allocation model and to include other factors.

  Dr. Cecka noted that the afternoon sessions included remarks made by the public representatives indicating concern about the concepts presented by the Kidney Committee. The topics discussed included:

  - The opinion that waiting time or dialysis time should be part of allocation. Many expressed the belief that an allocation system based on LYFT alone would be trading equity for benefit.

  - The suggestion that there may be a risk of unintended consequences such as an increase in transplant tourism by older patients with financial means, and an increase in living donor transplants if candidates were made to feel their chances of receiving a deceased donor transplant were less.

  - Older patients may lose hope if they felt that a kidney allocation system based on "pure benefit" discriminates against them.

  The Kidney Committee is looking for guidance as to what percent of the kidney allocation system should use net benefit. The most recent simulations provided by the SRTR include A_2 to B transplants, eliminating both the 0MM priority and paybacks, and adding waiting time or dialysis time.

  The Kidney Committee also discussed the possibility of incorporating a donor risk index (DRI) into the allocation system. It was suggested that the current system, which separates kidneys into only two categories based on risk of graft loss (standard criteria donors, SCD or expanded criteria donors, ECD) is not adequate and may contribute to organ waste. The Kidney Committee reviewed data that indicated the risk of graft loss for transplanted SCD and ECD kidneys overlaps. This means that there are some SCD kidneys with graft function that is less than that of some ECD kidneys. However, Dr. Cecka noted there is a perception within the transplant community that all ECD kidneys are of a lesser quality, making it more likely that ECD organs are discarded. Therefore, it was suggested that kidneys could be graded on a continuous scale rather than just categorized as SCD or ECD. Many participants also expressed a need to better match a candidate's life expectancy with the graft life expectancy. The Kidney Committee requested

additional simulation modeling to investigate the outcomes of incorporating a donor risk index using a sliding scale to the existing models.

The Kidney Committee reviewed the results of several models provided by the SRTR. Alan Leichtman, M.D., SRTR representative to the Committee, went over these data with the Histocompatibility Committee with input from Drs. Leffell and Cecka. These analyses included the impact of incorporating a weighting factor for each year of end stage renal disease (ESRD) measured by time on dialysis. Four different simulations were conducted to test the effect of including factors of 0.1. 0.2, 0.5, and 1.0 for each year of ESRD. The Committee reviewed the effect of each change on the projected number of kidneys that would be allocated to candidates in different ethnic groups, blood types, age groups, sensitization levels and diagnosis categories.

Dr. Leichtman said it was too early to comment on the effect CPRA would have on the model. Most of the Committee members present predicted the number of candidates that will be defined as sensitized will drop. Dr. Cecka asked Dr. Leichtman about a discrepancy in the number of sensitized patients who are actually transplanted and those that are modeled to be transplanted. Dr. Cecka said that the models used by the SRTR reported 20% of sensitized candidates with a PRA >80% are being transplanted but in reality the number is closer to about 7%. Dr. Leichtman reported that the SRTR will be reexamining that portion of the simulation model.

Lea Ann Baxter-Lowe, Ph.D., the Region 5 representative to the Histocompatibility Committee, suggested that the Committee push for the inclusion of young adults in the 0 ABDR mismatch priority. Other members of the Committee asked if there were plans to give priority to sensitized candidates. Dr. Leichtman suggested that the Histocompatibility Committee make formal recommendations to the Kidney Committee, in the form of a letter, which would outline the Committee's position on various topics relating to histocompatibility. The Committee approved this idea. Dr. Baxter-Lowe is working on a draft to be presented to the Committee at a later date. The sub-committee addressing the reality of a virtual crossmatch is also going to review suggestions for additional proposals. Those who attended the forum and the Kidney Committee meeting emphasized to the Histocompatibility Committee that a formal proposal has not been finalized and that it is not known when such a proposal can realistically be made.

- Discussion of Additional HLA, PRA, Antibody Identification and Unacceptable Data. Drs. Eisenbrey, Geier, and Baxter-Lowe presented a work sheet to the Committee that would be used to collect additional histocompatibility information on kidney transplant candidates. The required fields would describe in detail the origin of all unacceptable antigens that are listed for a given candidate, whether actual antibody was detected, and what method was used to define those antibodies. They thought that the provision in the newly approved CPRA policy 3.5.11.3 that states it is the prerogative of the transplant center to establish criteria for additional unacceptable antigens makes it vital to capture how the unacceptable antigens were defined for research purposes. Dr. Geier also stressed it was important to continue collecting recipient peak and current class I and II PRA data, at least for a short period of time, to see how well the CPRA system is working and how well programs are listing unacceptables for their highly sensitized candidates.

  The Committee questioned where these data would be collected (i.e. Waitlist or Tiedi®), when the information would be collected (at transplant or at initial listing), and how the information would be collected. Dr. Cherikh mentioned that it was too late to make any changes to the Tiedi®forms this year, so the information would have to be collected on the waitlist. However, in many cases, the transplant coordinator filling out the waitlist forms may not have access to all the requested information.

  Others on the Committee felt that other means, such as a survey, could provide the desired information.. Committee members noted there are plans to request information listing the reason(s) an intended sensitized candidate was not transplanted when a candidate with CPRA $\geq$ 80 is awarded the extra PRA points, but does not receive the organ. They thought this mechanism should supply the data needed to monitor the effectiveness of the new policy.

  Drs. Eisenbrey and Geier agreed to reexamine the issues involved and to develop an alternative plan.

- Alternative system request. The Board approved of the following resolution in December 2006.

***RESOLVED, that the following modifications to Policy 3.5.11.3 (Panel Reactive Antibody) shall be approved, effective pending notice and programming in UNet[sm] if and as applicable:

3.5.11.3 ~~Panel Reactive Antibody. A Waiting List candidate who is listed with a PRA of 80% or e 4 points when one or more HLA antigens against which the candidate has antibody is specified on the Waiting List. The unacceptable antibodies listed should be able to support a PRA level of 80% or greater. Any serum (current or peak) can be used, as used for crossmatch suitability, but without the specification of unacceptable antigen(s) that support the PRA, the candidate will not receive the additional four points for high PRA.~~ Sensitized Wait List Candidates - Calculated PRA (CPRA). CPRA is the percentage of donors expected to have one or more of the unacceptable antigens indicated on the Waiting List for the candidate. Sensitized Waiting List candidates with defined unacceptable HLA antigens that yield a CPRA of 80% or greater will be assigned 4 points. Each transplant center may define the criteria for unacceptable antigens that are considered as contraindications for transplantation. Unacceptable antigens that are defined by laboratory detection of HLA specific antibodies must be determined using at least one solid phase immunoassay using purified HLA molecules. It is the prerogative of the transplant center to establish criteria for additional unacceptable antigens, such as repeat transplant mismatches. The CPRA will be calculated automatically when the unacceptable antigens are listed or updated on the Waiting List. The CPRA will be derived from HLA antigen/allele group and haplotype frequencies for the different racial/ethnic groups in proportion to their representation in the national deceased donor population.

As a result of the changes to the policy, modifications will be made to national and alternative kidney allocations systems to accomplish the replacement of PRA with the calculated PRA (CPRA), while retaining the 80% cutoff for eligibility for the high sensitization points. The Committee recommended that this policy modification be applied to all OPOs with approved alternative systems as well as the national system of kidney allocation, unless an OPO requests that the use of the CPRA be incorporated into its existing alternative system for assigning priority in sensitized patients.

Therefore, the Board also approved the following resolution to clarify the programming for Policy 3.5.11.3. It will be applied to OPOs operating with approved alternative systems for allocating kidneys as well as the national system for kidney allocation.

> ** RESOLVED, that the modifications to Policy 3.5.11.3 (Panel Reactive Antibody) approved by the Board of Directors shall pertain to all OPOs operating with approved alternative systems for assigning priority in sensitized kidney patients as well as the national kidney allocation system, unless application is made by an OPO to incorporate the use of a Calculated PRA (CPRA) into its existing alternative system. Such applications must be made in accordance with Policy 3.4.7.1 and be presented to the Histocompatibility Committee no later than February 1, 2007. OPOs may maintain the components of alternative systems that are not affected by the Histocompatibility Committee's implementation of CPRA as set forth in Policy 3.5.11.3

Therefore, an OPO desiring to continue its alternative system for the allotment of sensitization points must make a formal request to the Histocompatibility Committee. All such requests must be accompanied by a research design, scientific objectives and analysis plans, in accordance with Policy 3.4.7.1, and submitted to the Histocompatibility Committee no later than February 1, 2007. Without a formal request from the OPO to retain its alternative system and incorporate the use of the CPRA, any alternative system for assigning priority in sensitized patients will be converted to the national system as described in Policy 3.5.11.3.

The state of Tennessee, which uses a statewide sharing agreement for the allocation of kidneys, made a formal request to the OPTN/UNOS Histocompatibility Committee to incorporate CPRA into its alternative system by the February 2007 deadline. Currently, Tennessee awards kidney transplant candidates with a PRA of 80% or higher 4 points, as is done in the national allocation system, but the state of Tennessee also awards 2 points to candidates with a PRA of 40-79%.

Deborah Crowe, Ph.D. from Tennessee Donor Services presented information to the Committee. UNOS data for the last 12 months were used to compare allocation in Tennessee with the rest of the nation. In the rest of the U.S., 8.4% of the patients listed had a PRA 40-79% and 5.8% of the transplants went to patients with this level of PRA. The state of Tennessee has two operating OPOs, Tennessee Donor Services, TNDS; and Mid South Transplant Foundation, TNMS. In TNMS, 11.3% of the list was in the 40-79% PRA group, while 7.8% of the transplants went to this group. In TNDS centers, 7.8% of the patients listed were in the 40-79% PRA group, and 7.1% of the transplants went to this group. This indicates that both TNMS and TNDS had greater success in transplanting the moderately sensitized patients.

Dr. Crowe also shared the percent of each sensitized group that was transplanted. She indicated that for the U.S as a whole, 18.0% of the low sensitized, 11.5% of the moderately sensitized, and 9.9% of the highly sensitized candidates were transplanted. This is compared to 17.0%, 16.0%, and 7.1% for TNMS and 27.0%, 22.0%, and 10.5% for TNDS, respectively. This also suggests that the extra two points given to the moderately sensitized candidate are beneficial.

After reviewing the data supplied by Dr. Crowe, the Committee voted to approve Tennessee's request. The Committee was especially interested in how the two extra points for moderately sensitized patients were affecting kidney allocation in Tennessee because a similar idea is being considered by the Kidney Committee.

The next step in the process will be to present the formal request to the Kidney Committee to approve this alternative system. If approved by the Kidney Committee, this request must go out for public comment and then be presented to the Board for final approval.

- Concerns from Region 1. The Committee reviewed a letter from Region 1 that included several questions regarding the implementation of CPRA. Committee members noted that the concerns listed had already been addressed in the Committee's responses to the CPRA Public Comment Document. Therefore, Dr. Leffell agreed to write a letter in response to the questions raised by Region 1 with a copy of the Committee's responses to the public comment document attached.

  During this discussion, several Committee members mentioned a common misconception that the Committee is proposing that kidneys should be shipped across OPOs on the basis of a "virtual crossmatch." The Committee agreed to write a letter to the Kidney Committee to clarify this misconception. This letter should include the points:

  - CPRA is not meant to be used for kidney allocation as a virtual crossmatch. CPRA is a tool that should be used by centers as PRA was, to define their highly sensitized candidates.
  - In principle, virtual crossmatches can be done with 100% accuracy on unsensitized candidates but only up to 75% or 80% accuracy in highly sensitized candidates.
  - A sub-committee made up of members of the Histocompatibility Committee, the Kidney Committee and the Pancreas Committee will monitor the number of intended sensitized candidates that are not transplanted due to a positive crossmatch.

.

Committee members agreed to emphasize to physicians that CPRA will reduce shipment of organs to sensitized candidates because fewer sensitized candidates will be appearing on the match runs as a result of being screened off for unacceptable antigens. If an organ is shipped to a sensitized candidate, there should be a higher probability that the candidate will have a negative crossmatch than the current system.

- Sub-Committee Report for the "Broader Geographic Sharing through Prediction of Crossmatch Result."

  Dr. Cherikh presented the results from an additional analysis to examine the accuracy of the negative prediction of crossmatch results for sensitized (peak or current PRA of 10%-79%) and highly sensitized (peak or current PRA of ≥80%) patients when including those who had antibodies to only class I antigens. The Sub-committee thought that the negative predictability may be increased by avoiding HLA-DP (one of class II antigen system) which is not being identified.

  Using patient unacceptable antigens and donor HLA listed by the labs, crossmatch result (positive or negative) was predicted and compared with the actual crossmatch result specified by the laboratory. Crossmatch result prediction was determined based on patient actual unacceptable antigens and donor HLA antigens. As previously done, the analysis was stratified by the method of identifying unacceptable antigens and crossmatch technique. When the total number of crossmatches in a specific combination of unacceptable antigen method and crossmatch technique was 10 or less, the results are not presented.

  For sensitized patients, the negative predictability was 23.5% (4 actual negatives out of 17 predicted negatives) when the combination of multiple antigen beads for antibody detection and flow for T-cell crossmatch technique was used, 57.1% (121 actual negatives out of 212 predicted negatives) for the combination of High Definition (HD) beads and anti-globulin, 63% (29 actual negatives out of 46 predicted negatives) for the combination of Elisa and anti-globulin, 68.5% (137 actual negatives out of 200 predicted negatives) for the combination of multiple antigen beads and anti-globulin, 80% (4 actual negatives out of 5 predicted negatives) for the combination of Elisa and wash/extended and 96.7% (29 actual negatives out of 30 predicted negatives) for the combination of Elisa and anti-globulin (Table 1).

  For highly sensitized patients, the negative predictability was 39.6% (44 actual negatives out of 111 predicted negatives) when the combination of Elisa for antibody detection and anti-globulin for T-cell crossmatch technique was used, 48.7% (19 actual negatives out of 39 predicted negatives) for the combination of HD beads and flow, 57.1% (210 actual negatives out of 368 predicted negatives) for the combination of HD beads and anti-globulin, 100% (4 actual negatives out of 4 predicted negatives) for the combination of Elisa and flow, and 100% (1 actual negatives out of 1 predicted negatives) for the combination of Elisa and wash/extended (Table 2). It was noted that although the number of predicted negatives in the last two groups was very small, the total number of crossmatches was 14 for Elisa and flow combination and 50 for Elisa and wash/extended combinations.

  Dr. Nikaein stated that the low prediction of negative crossmatch may be due to the contribution of the following factors:

  1. Presence of antibodies to HLA-C which were not reported;
  2. Use of drawn sera from different dates for performing PRA as compared to crossmatch;
  3. Low number of tests in each category.

  Prediction of positive crossmatch was comparable to the study performed in 2006 on highly sensitized patients.

- New Business, Dr. Leffell introduced several new topics in an effort to get the Committee to begin thinking about them for later discussion.

  First, she asked the Committee to think about developing a formal policy that would require transplant centers to share the data from candidates that have been transferred from one center to another. This information would include previous transplant HLA and previous PRA. The problem is some laboratories do not maintain data or will not share it. Dr. Land mentioned that institutionally there is some confusion about HIPAA regulations and patient confidentiality. The Committee agreed that there was a need for a formal policy proposal. Dr. Leffell volunteered to write the draft for the Committee to review at a later date.

She also asked the Committee to begin thinking about how the new CPRA policy should accommodate desensitization protocols. Dr. Leffell has been contacted by several centers that would like their highly sensitized candidates, who have had desensitization treatment, to be allowed to keep their CPRA points, but not be screened from match runs for listed unacceptable antigens. Dr. Leffell suggested the centers apply for an alternative system if they wish to use an approved desensitization protocol. The Committee approved of this concept and tabled the discussion for the next meeting.

- Lori Gore, Committee Liaison, reported that UNOS IT staff learned that OPOs can now run kidney, kidney/pancreas, and pancreas matches without the donor HLA entered into DonorNet®. These match runs were being used to make electronic offers by OPOs using DonorNet® 2007. Several transplant programs have complained about this situation. Therefore, a group of UNOS staff members met on February 16, 2007 and determined the following solutions:

    - SCD Kidney matches – When a kidney match is run without donor HLA, a warning message will notify the center that the match will be closed at zero preventing electronic offers.
    - ECD Kidneys matches – Due to specific policy permitting ECD kidney offers to be made without donor HLA, ECD kidney matches run without donor HLA display a warning message reminding/warning the user that donor HLA is missing, but the match will not be closed at zero.
    - Pancreas and Kidney/Pancreas matches– Because of complications regarding procedures for the "facilitated Pancreas" match runs, the missing donor HLA warning message will be displayed, but the match will not be closed at zero.

  The Committee had no objections to this proposal and UNOS IT staff will make the changes.

Members Present

Susie Leffell, Ph.D.	Chair
J. Michael Cecka, Ph.D.	Vice Chair
John M Hart, MBA,CHS	Region 2
Dod Stewart, BS, CHS	Region 3
Afzal Nikaein, Ph.D.	Region 4
Lee Ann Baxter-Lowe, Ph.D.	Region 5
Diane I Kumashiro,MS,CHS	Region 6
Thomas W Sell, CHS, CLS	Region 7
Steve Geier, Ph.D.,	Region 8
Charlene Hubbell, MT	Region 9
A. Bradley Eisenbrey, M.D., Ph.D.	Region 10
Diane Pidwell, Ph.D.	Region 11
Ron Kochik, B.S.N., RN	At Large
Deborah Miller, MPH, MT	At Large
Jerry Rosenberg, M.D., Ph.D.,	At Large
Geof Land, Ph.D.	Ex Officio

UNOS Staff

Lori Gore	Committee Liaison
Wida Cherikh, Ph.D.	Data Liaison
Ann Harper	Data Liaison
Dielita McKnight	IT Liaison

SRTR

Alan Leichtman, M.D.

Table 1. Accuracy of Prediction of Crossmatch Outcome Based on Reported Unacceptable Antigens By Unacceptable Antigen (UA) Method and T-Cell Crossmatch Technique For Sensitized Patients (Peak or Current PRA of 10%-79%) Excluding Patients with Class II Unacceptable Antigens

			T-Cell X-Match Results				All	
			N		P/WP			
			N	%	N	%	N	%
UA Method	**T-Cell Technique**	**Predicted X-Match Results**						
Cytotoxicity - AHG	Anti-Globulin	N	29	96.7	1	3.3	30	100.0
		P	0	0	4	100.0	4	100.0
		All	29	85.3	5	14.7	34	100.0
Elisa	Anti-Globulin	**Predicted X-Match Results**						
		N	29	63.0	17	37.0	46	100.0
		P	3	14.3	18	85.7	21	100.0
		All	32	47.8	35	52.2	67	100.0
	Wash/Extended	**Predicted X-Match Results**						
		N	4	80.0	1	20.0	5	100.0
		P	7	87.5	1	12.5	8	100.0
		All	11	84.6	2	15.4	13	100.0
Multiple Antigen Beads	Anti-Globulin	**Predicted X-Match Results**						
		N	137	68.5	63	31.5	200	100.0
		P	1	2.0	50	98.0	51	100.0
		All	138	55.0	113	45.0	251	100.0
	Flow	**Predicted X-Match Results**						
		N	4	23.5	13	76.5	17	100.0
		P	4	40.0	6	60.0	10	100.0
		All	8	29.6	19	70.4	27	100.0
HD Beads	Anti-Globulin	**Predicted X-Match Results**						
		N	121	57.1	91	42.9	212	100.0
		P	42	25.8	121	74.2	163	100.0
		All	163	43.5	212	56.5	375	100.0

Table 2. Accuracy of Prediction of Crossmatch Outcome Based on Reported Unacceptable Antigens By Unacceptable Antigen (UA) Method and T-Cell Crossmatch Technique For Highly Sensitized Patients (Peak or Current PRA ≥80%) Excluding Patients with Class II Unacceptable Antigens

			T-Cell X-Match Results					
			N		P/WP		All	
			N	%	N	%	N	%
UA Method	**T-Cell Technique**	**Predicted X-Match Results**						
Elisa	Anti-Globulin	N	44	39.6	67	60.4	111	100.0
		P	58	13.5	372	86.5	430	100.0
		All	102	18.9	439	81.1	541	100.0
	Flow	**Predicted X-Match Results**						
		N	4	100.0	0	0	4	100.0
		P	2	20.0	8	80.0	10	100.0
		All	6	42.9	8	57.1	14	100.0
	Wash/Extended	**Predicted X-Match Results**						
		N	1	100.0	0	0	1	100.0
		P	27	55.1	22	44.9	49	100.0
		All	28	56.0	22	44.0	50	100.0
HD Beads	Anti-Globulin	**Predicted X-Match Results**						
		N	210	57.1	158	42.9	368	100.0
		P	172	15.6	930	84.4	1102	100.0
		All	382	26.0	1088	74.0	1470	100.0
	Flow	**Predicted X-Match Results**						
		N	19	48.7	20	51.3	39	100.0
		P	9	5.4	158	94.6	167	100.0
		All	28	13.6	178	86.4	206	100.0