

## HLA Antibody Detection and Organ Transplant

Renal transplant is one of the treatment options for patients with end-stage renal disease (ESRD). ESRD patients on the transplant waiting list need full medical and psychosocial evaluation to ensure that they are suitable candidates for transplant. All patients waiting for kidney transplants should be arranged for blood tests which include human leukocyte antigen (HLA) typing and HLA antibody analysis. Division of Transplantation and Immunogenetics in Queen Mary Hospital is the only laboratory under Hospital Authority that is accredited to provide these laboratory services. HLA matching and detection of antibody play an important role in transplantation that would enhance the kidney allograft survival.

### HLA Typing

HLA genes are inherited from parents. HLA is a very complex protein found on most cells in your body. HLA antigens are mainly divided in three classes; Class I (HLA-A, B, C), Class II (HLA-DR, DQ, DP) and Class III which encode components of the complement system. Matching Class I and Class II HLA is as important as the ABO blood group matching. HLA plays a significant role in regulation of the immune system. HLA typing test must be done before receiving a kidney transplantation.

### Risk of Rejection

When a patient receives a donor's organ, patient's immune system may recognize the received organ as 'foreign' and attack the foreign tissue. This process is called rejection. HLA matching between donor and recipient is crucial to reduce the risk of rejection.

### Pre - Transplant Antibody Analysis

Antibody is responsible for identifying and neutralizing pathogens. On the other hand, antibody also recognizes "non-self" tissue and sees those as invader, resulting in rejection. To reduce risk of rejection, patients awaiting kidney transplant will have regular blood test for detection of HLA antibodies.

Antibody tests are performed:

- every 3 months,
- 2 weeks after blood transfusion,

Blood taking will be arranged in your Renal Unit.

### Crossmatch Test before Transplant

Crossmatch is performed by mixing cells from the donor with the patient's serum. If patient's serum has antibodies against the donor's cells, the antibodies will bind the donor cells. If these antibodies are at high level, the donor cells will be destroyed. This is called a positive crossmatch. A positive crossmatch is unfavorable for transplant which signifies that the patient's antibody will attack the donor's cells and will likely result in rejection. The crossmatch test must be performed before the kidney transplantation for the recipient/donor pair.

### Rejection Reaction

Transplant rejection occurs when transplanted organ is attacked by the recipient's immune system, resulting in destruction of the transplanted tissue, loss of function and systemic reaction. There are three classic phases of kidney transplant rejection, namely hyperacute, acute and chronic rejection.

Hyperacute rejection occurs within minutes to hours after the anastomosis of blood supply to the transplanted kidney. Acute rejection occurs within 7 to 60 days. These kinds of rejections may be due to previous sensitization through transfusions, pregnancies, previous transplant or infections. Chronic rejection may occur several months after kidney transplant with vascular thickening, leading to ischemic changes.

### Rejection Prevention Monitoring

It is believed that the better the HLA match between the donor and the recipient, the better outcome the transplant will be. In order to prevent and reduce rejection episode, patient must have adequate assessments (including ABO blood group compatibility, HLA matching and antibody analysis) prior to the transplant.

## Guarding Recipient Against Failed Transplant (GRAFT) Programme

GRAFT Programme aims to reduce the risk of graft rejection and to enhance graft survival rate after transplant.

After transplant, blood tests for post-transplant antibody monitoring are arranged by the follow-up Renal Unit and according to the schedule below:

PHASE 1: Weekly	1 <sup>st</sup> week, 2 <sup>nd</sup> week , 3 <sup>rd</sup> week, 4 <sup>th</sup> week
PHASE 2: Monthly	2 <sup>nd</sup> month, 3 <sup>rd</sup> month
PHASE 3: Quarterly	6 <sup>th</sup> month, 9 <sup>th</sup> month, 12 <sup>th</sup> month
PHASE 4: Yearly	Every subsequent year

(Attention: Please check with your Renal Unit for the schedule. Individual unit may have different arrangement.)

**For any enquiry, please contact:**  
**Division of Transplantation and Immunogenetics,**  
**Laboratory Transplant Coordinator: 2255 2536**


**Information provided by:**  
**Division of Transplantation and Immunogenetics**  
**Queen Mary Hospital**



瑪麗醫院  
**Queen Mary Hospital**

移植及免疫遺傳學部  
**Transplantation and Immunogenetics Division**

**HLA 抗體檢測與器官移植**  
**Anti-HLA Antibody and Organ Transplant**

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## HLA抗體檢測與器官移植

為配合末期腎病患者輪候腎臟移植，加強患者和移植器官的存活率，患者必須接受全面的移植前評估。所有輪候腎臟移植患者都會安排到瑪麗醫院，抽血檢驗作血液測試，包括人類白血球組織抗原HLA檢測和血液抗體分析。瑪麗醫院移植及免疫遺傳學部是全港唯一化驗室為患者和捐贈者檢驗配對HLA，讓器官移植在安全的情況下進行。

## 人類白血球組織抗原HLA檢測

人類白血球組織抗原HLA檢測是由父母遺傳下來的一種極複雜細胞膜之醣蛋白，提供細胞辨識、抗原刺激及調控免疫反應等功能。HLA是影響移植器官存活之重要因素，其重要性僅次於紅血球細胞ABO血型抗原。HLA檢測又稱為人類白血球組織抗原檢測，有分為第一型(HLA-A、B、C)和第二型(HLA-DR、DQ、DP)。患者在接受腎臟、骨髓移植前，都必須進行HLA檢測。

## 排斥

當患者接受器官移植後，這種「非己」的器官存在於患者體內，或會受到患者免疫系統的「攻擊」，這就是醫學術語所稱的「排斥反應」。通過配對捐贈者和患者的HLA，可望盡量減低移植後的排斥反應。

## 抗體

抗體，又稱免疫球蛋白，是一種由B淋巴細胞分泌，讓免疫系統用來鑑別與中和外來物質如細菌、病毒等。抗體可以「標記」細胞及外來物，從而誘發免疫機制對其進行攻擊，而產生排斥反應。由於抗體會生病者受到感染、輸血、懷孕或移植後產生，所以在等候移植期間，定期抽血檢查是必須的。

抗體檢測會定期安排在：

- 每三個月一次和輸血後兩星期；及或因應個別檢測結果，在所屬腎科中心抽血檢查。

## 器官移植前交叉配型檢測

交叉配型由患者血清與捐贈者的淋巴細胞共同進行培養，如果患者血清中沒有HLA特異性抗體，交叉配型檢測結果會呈陰性，相反交叉配型檢測結果則會呈陽性。在移植手術前，需分別進行至少兩次交叉配型檢測，確定結果是陰性才進行手術，以減低排斥風險。

## 排斥與防禦

由於腎臟移植患者與捐贈者之間存在著人類抗原的差別，移植手術後有機會出現排斥反應，直接影響移植腎臟的存活。

為了避免或減少排斥反應，移植手術前必須進行多項檢測，包括紅血球細胞ABO血型抗原、人類白血球細胞抗原HLA和抗體識別等。

## 移植後排斥反應

抗體可以「標記」細胞及外來物，從而誘發免疫機制對其進行攻擊。移植後產生排斥反應，主要是抗體識別移植器官為外來組織而作出「攻擊」，導致移植腎組織受破壞、功能喪失和系統性反應。

排斥反應分為超急性、急性和慢性。超急性排斥反應發生於移植腎血液循環恢復後，可以在幾分鐘、幾小時或一至兩天內發生。急性排斥反應一般發生於移植後七至六十天，多出現於組織配型欠佳的情況。慢性排斥則在移植後半年以上才出現，病人臨床可能沒有症狀，腎功能也正常，但移植腎血流量可能出現異常。移植後若出現任何排斥反應，必須立即妥善處理。

## 器官排斥防禦計劃

為監控病人在移植手術後之排斥風險，減少移植失敗，和提高病人的生存機率，醫生會為病人安排定期檢測抗體。

病人請緊記移植手術日期，並於手術後按指示(如下表列)定期到所屬腎科中心抽血，以作抗體檢測。

## 手術後各階段的檢測安排

第一階段每週一次	第一週 第二週 第三週 第四週
第二階段每月一次	第二個月 第三個月
第三階段每季一次	第六個月 第九個月 第十二個月
第四階段每年一次	手術後第二年開始 每年一次

(注意：醫生或需因應個別情況而另作安排)

病人請於覆診時帶同抽血咭，並留意咭上抽血日期，以便覆診時作出安排。

如有任何疑問，請與移植及免疫遺傳學部  
移植主任聯絡：2255 2536

以上資料由瑪麗醫院移植及免疫遺傳學部提供