1. **Purpose**.

This document describes the functionality and operation of the webservice provided by ETRL.

The service is a SOAP based webservice and performs calculations on the HLA type of a panel of donors. The change to receive an organ and the percentage panel reactivity antibody can be requested.

2. Parameters, functions and response

The web service offers these functions:

- Calculate vPRA.
- Calculate the chance to receive a kidney via ETKAS
- Calculate the chance to receive a kidney via the AM program
- Calculate the chance to receive a heart

2.1 Parameters request

There are two distinct parameters.

The **antigens** (sUnacceptables, sAcceptables en sTyping) is a string with the different HLA antigens divided by a space, comma or both. For example: : 'A1 A3 B15 B62 B63 Bw4 Bw6 Cw3 Cw7 DR6 DR13 DR52 DQ1 DQ5 DQ6'.

The other parameter is the **blood group**. This string always needs to be provided in case of chance of receiving an organ calculations and can have the values 'A', 'B', 'AB' or 'O'.

2.2 vPRA function

Here, the percentages panel reactivity antibody are calculated, taking into account the unacceptable HLA-A, -B, -C, -DR en DQ antigens as entered in string **sUnacceptables.** The program counts the number of donors who don't have any of the entered unacceptable antigens.

2.3 Function FrequencyETKAS.

This function calculates the chance to receive a kidney, taking into account the unacceptable HLA-A, -B, -C, -DR en DQ antigens as entered in string **sUnacceptables** and the blood group **ABO**. The program counts the number of donors with the same blood type, who also don't have any of the entered nonacceptable antigens.

2.4 Function FrequencyAM.

This function calculates the chance to receive a kidney within the AM program, taking into account the typing in **sTyping,** the acceptable antigens in **sAcceptables** and the blood group in **ABO.** Only the splits of A-, B- en DR antigens can be provided. Broads and other antigens will be ignored. For all loci two antigens must be filled in. In case of a homozygous antigen, fill in the same antigen twice, for example: 'A1 A1 B8 B8 DR17 DR17' is correct, whereas 'A1 B8 DR17' is not correct. For the blood type, the search will be for donors with a compatible blood group.

Function FrequencyHeart.

Calculates the chance to receive a heart, taking into account the unacceptable HLA-A, -B, -C, -DR en DQ antigens as entered in string **sUnacceptables** and the blood group **ABO.** The program counts the number of donors with the same blood type, who also don't have any of the entered unacceptables antigens.

2.5 **Response.**

The response is equal for all functions and consists of a frequency, the number of matches, the panel size and possibly an error response. The response is also available as a class, ETRLResponse.

For example:

```
<ETRLResponse xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns="http://ETRL.ORG/">

        <Frequency>29.025</Frequency>
        <Matches>1994</Matches>
        <PanelSize>6870</PanelSize>
        <ErrorMessage/>

</ETRLResponse>
```

3   Error handling.

An error notification, can be the report of an error or a warning. A warning is always preceded by 'Warning'. In case of an error, no result will be generated, in case of an warning results will be generated regardless.

Warning example: 'Warning: Only HLA-A, -B and -DR (except DR51, DR52 and DR53) are used for acceptable antigens and patient's typing.'.

Error example: 'Patients HLA-A, -B and -DR typing must consist of two antigens. For homozygous antigens please enter the antigen in duplicate.'

4   Compatible blood group.

For some functions, the blood group does not have to an exact match, this is called a compatible blood group as described below:
- Blood group O matches O,
- Blood group A matches A,
- Blood group B matches B,
- Blood group AB matches A, B and O.

5   URL.

The URL is www.etrl.org/calculator/calculator.asmx.

6   Contact.

For technical questions or feedback, please contact:

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