

OpenTransplant*: A Collaboration in Assessment of Transplant Risk

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What is OpenTransplant?

- A free collaborative risk stratification portal
- A 'one-stop shop' for HLA compatibility
- Assesses epitope level risk using multiple algorithms simultaneously
- Can be a repository of epitope with censored outcome data
- Users have ability to share survival cohorts
 ↑ collaboration = ↑ dataset for outcome estimates

Uniquely OpenTransplant will allow users to upload large cohorts of censored graft survival data. The portal will then evaluate epitope compatibility using multiple programs and report this in context of outcomes (rejection, CLAD, overall survival)

Design and development

The basis of OpenTransplant is experimental statistical and machine learning methods, these were implemented to incrementally build transplant survival models. As OpenTransplant handles cohort data across time and location it is adjusted for heterogeneity in post-transplant support and variables associated with recovery not related to HLA mismatching. The portal provides to the transplant research community a unique way to develop, deploy and test prediction algorithms.

The initial survival models used as a reference are stratified Kaplan Meier curves but as more teams use the collaborative portal more specific hazard functions will be created to allow transplant teams to identify the risk associated with a particular transplant event.

Platform pilot prototype has been presented to our early adopters and collaborators with a positive reception and valuable feedback.

Collaboration partners

- Prof. Greg Snell – Alfred Hospital Lung Transplant Unit
- Prof. Rene Duquesnoy – University of Pittsburgh Medical Center
- Prof. Gerald Morris – University of California, San Diego
- PIRCHE
- National Polish Transplant Organization

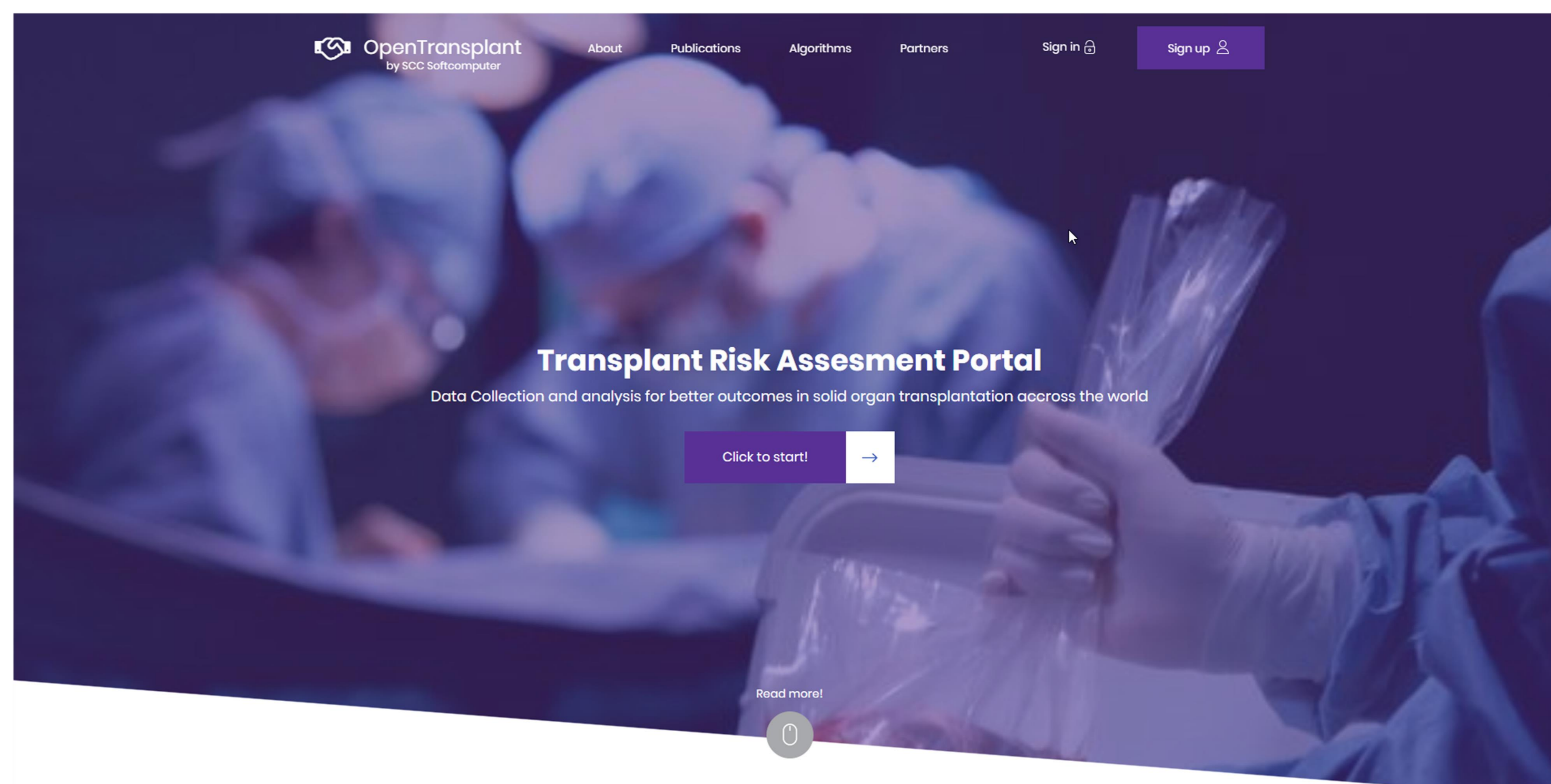


Figure 1 – Application log in screen. Patient data privacy mechanisms complies with the standards of GDPR and HIPAA acts. Shared cohort data will be anonymized with an option to withdraw them from the portal.

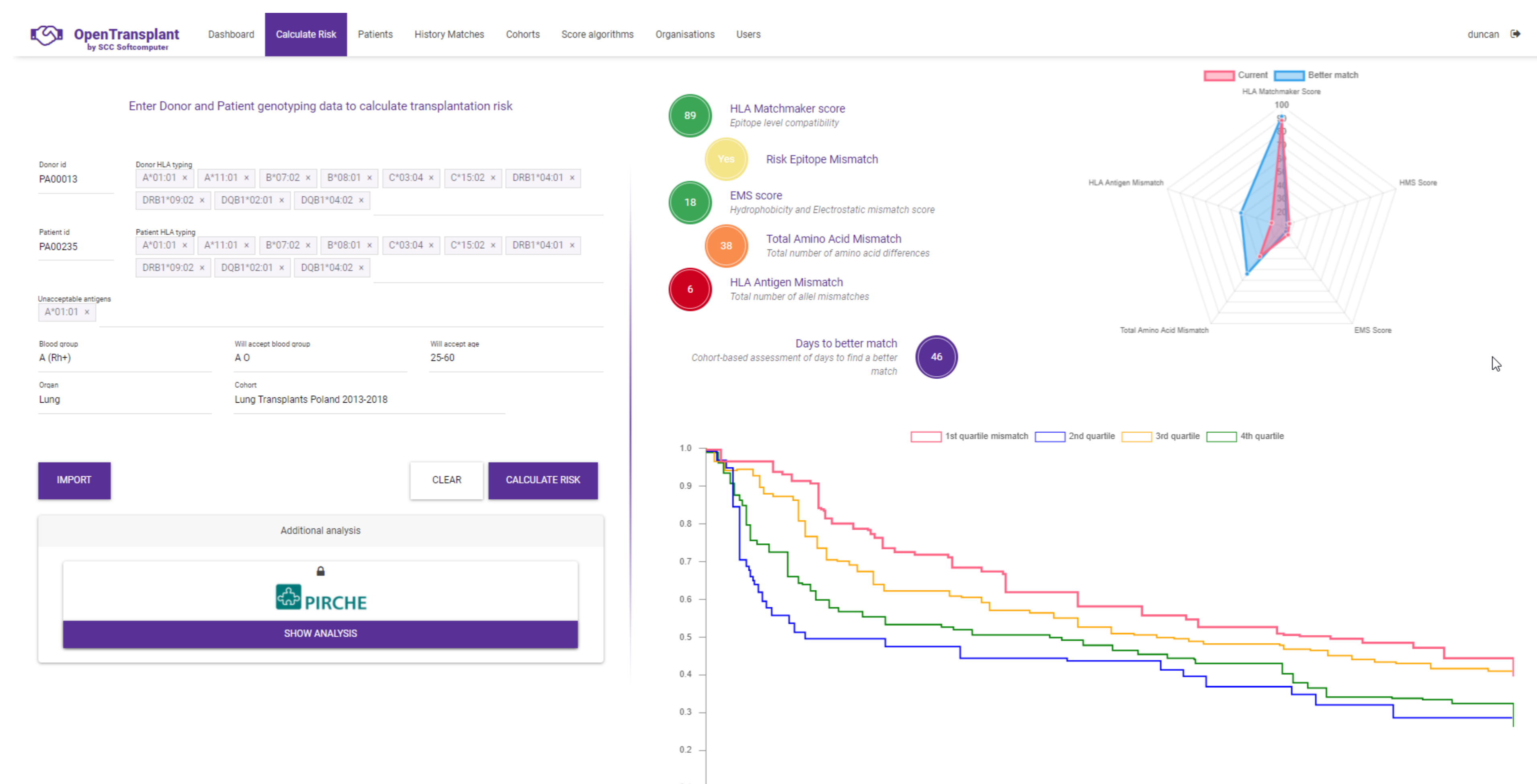


Figure 2 – OpenTransplant performs in real-time a risk stratification based on all algorithms and in the context of a survival cohort. Allowing users to assess matching results in an actual clinical-oriented approach

Type	Id	External#	Gender	Organ	Type
Donor	PA00013	en23	Male	Kidney	Donor
Recipient	PA00015	en24	Male	Kidney	Recipient
Recipient	PA00235	en45	Male	Lung L	Recipient
Recipient	PA00345	enx1	Female	Lung R	Recipient
Donor	PA00346	enx2	Male	Kidney	Donor
Donor	PA00462	ax10	Female	Heart	Donor

Figure 3 – Patient data uploaded into OpenTransplant will be handled under strict privacy standards as set out by appropriate governing bodies and remain the property of contributing teams

Implemented	Planned
HLAMatchmaker	PIRCHE
Risk Epitope MM	EMS-3D
Total amino acid mismatch	HLA-EMMA
Antigen mismatch	

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* For research purposes only. Not to be used for treatment or diagnosis of patients.