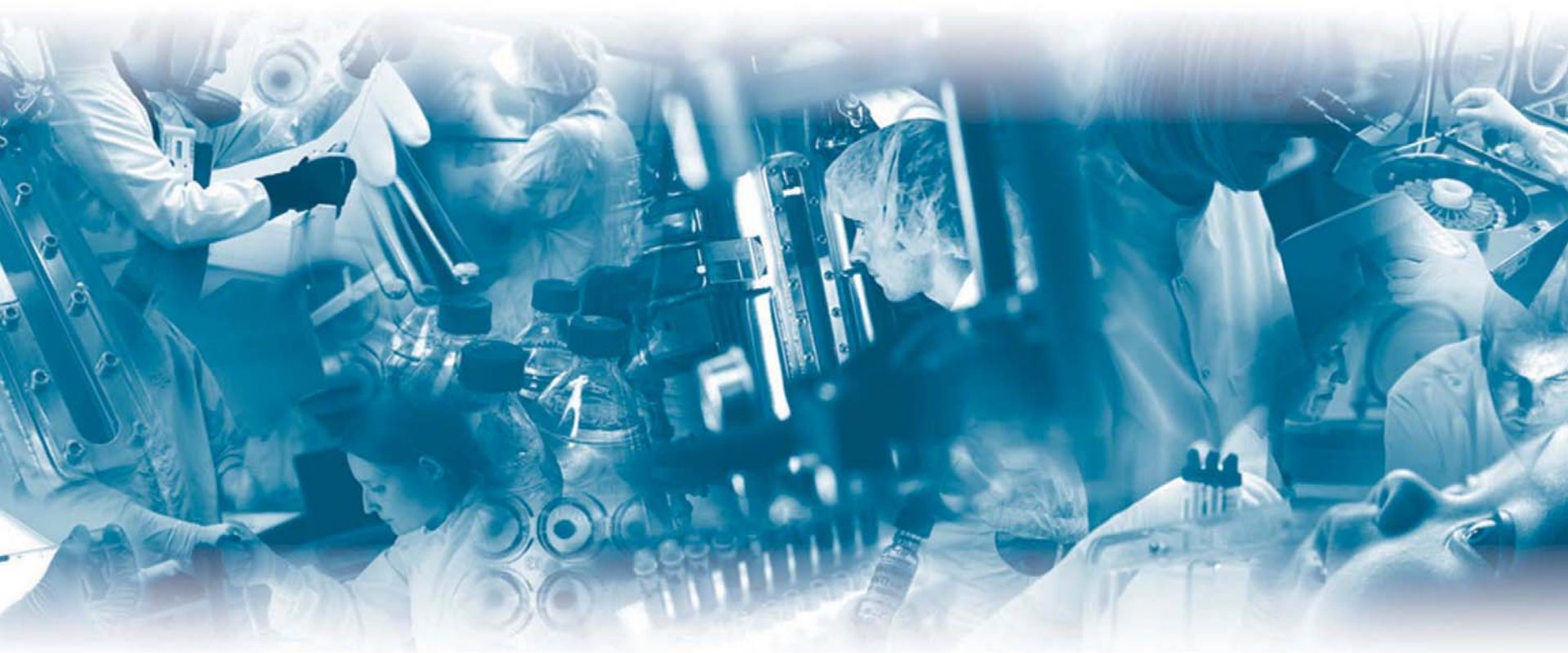




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Gordon Robb

Operations Director

Aim of presentation

- **Overview of Alba Bioscience Microarray developments**
- **Highlight manufacturing implications**
- **Review development and regulatory issues and strategy**
- **Presentation of some preliminary data**

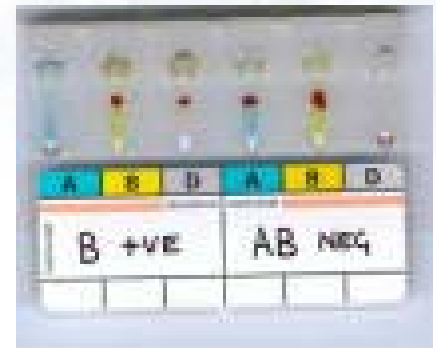
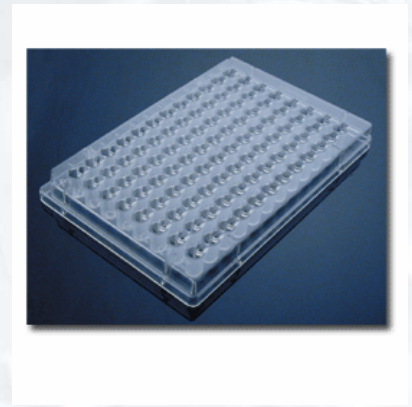
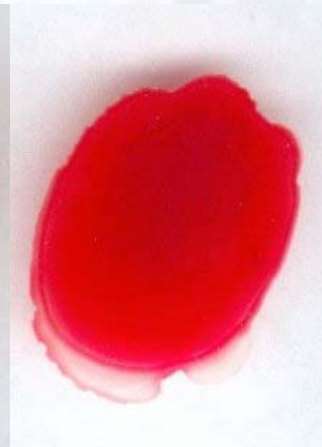
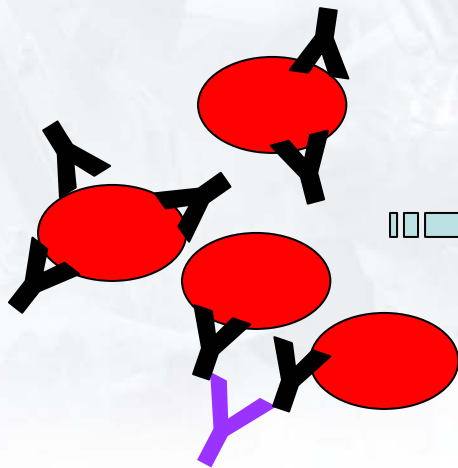
Microarray Project Aim



- Focus on microarray technology as the next generation test platform for blood donation screening
- Protein/carbohydrate/cell based arrays (not genetic testing)
- A single platform to combine blood typing, microbiology and virology testing

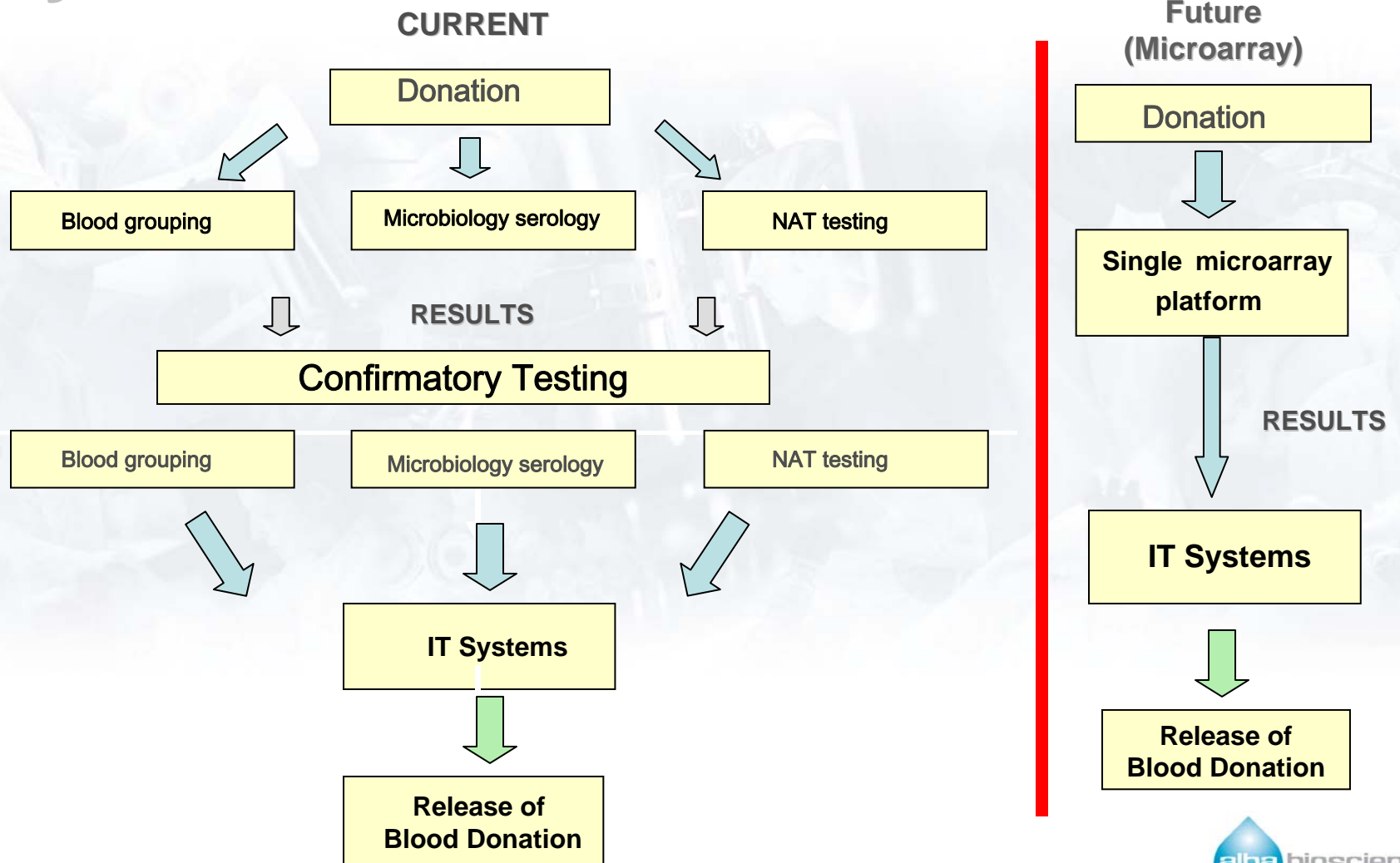
Current blood testing procedures

Based on the principle of antibody:antigen interactions to determine presence or absence of a target e.g. blood group



Usually performed in liquid phase

Current Testing v Microarray Systems

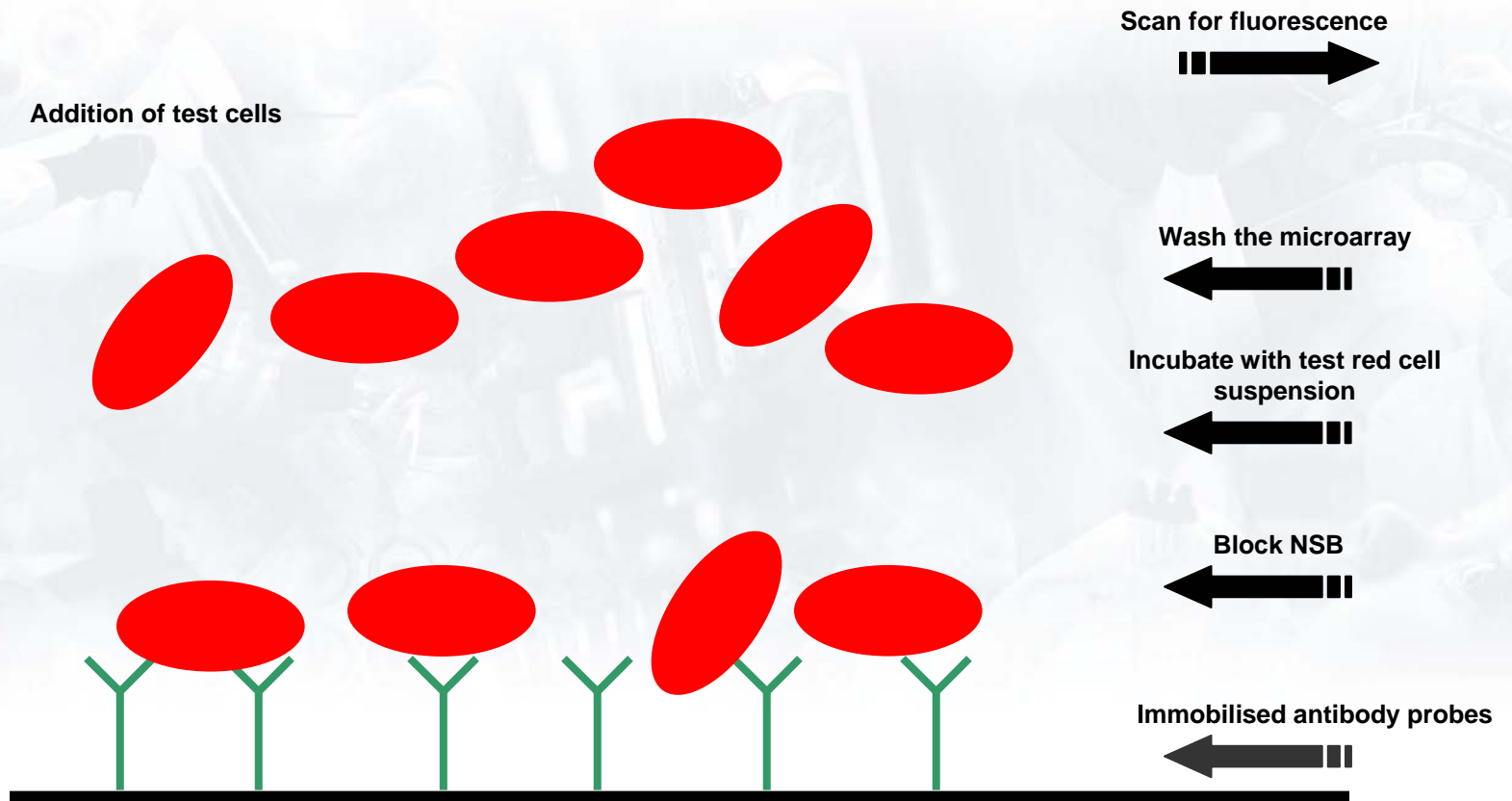


Microarrays: Benefits

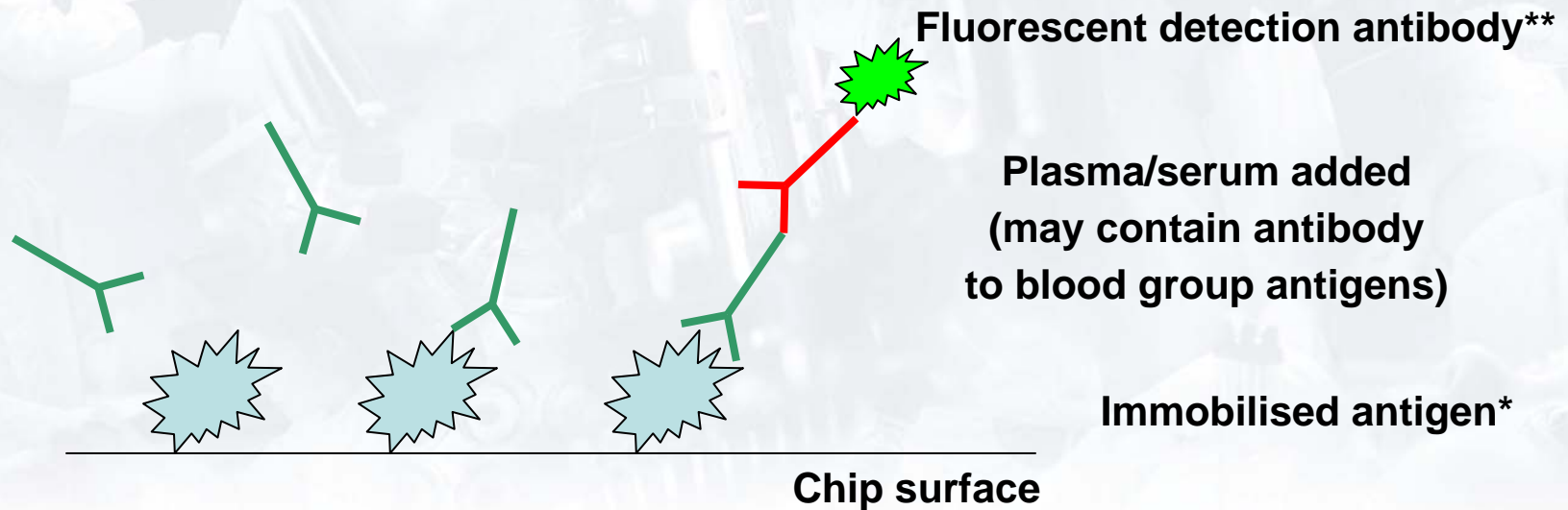
- **Speed / Multiplexing / Multiparameter**
 - High throughput testing – all required tests on one platform
 - Extended assay profile – include all desirable as well as mandatory tests
 - No confirmatory testing required – replicate testing performed simultaneously
- **Reduced Costs**
 - Single Instrument v 3 instruments (capital, maintenance etc)
 - Staff: 1 lab v 3 labs
 - No repeat/confirmatory testing
 - Reduced sample requirement
- **Patient Safety**
 - Single sample
 - Improved sensitivity & specificity
 - Single IT interface



Design of the blood typing microarray



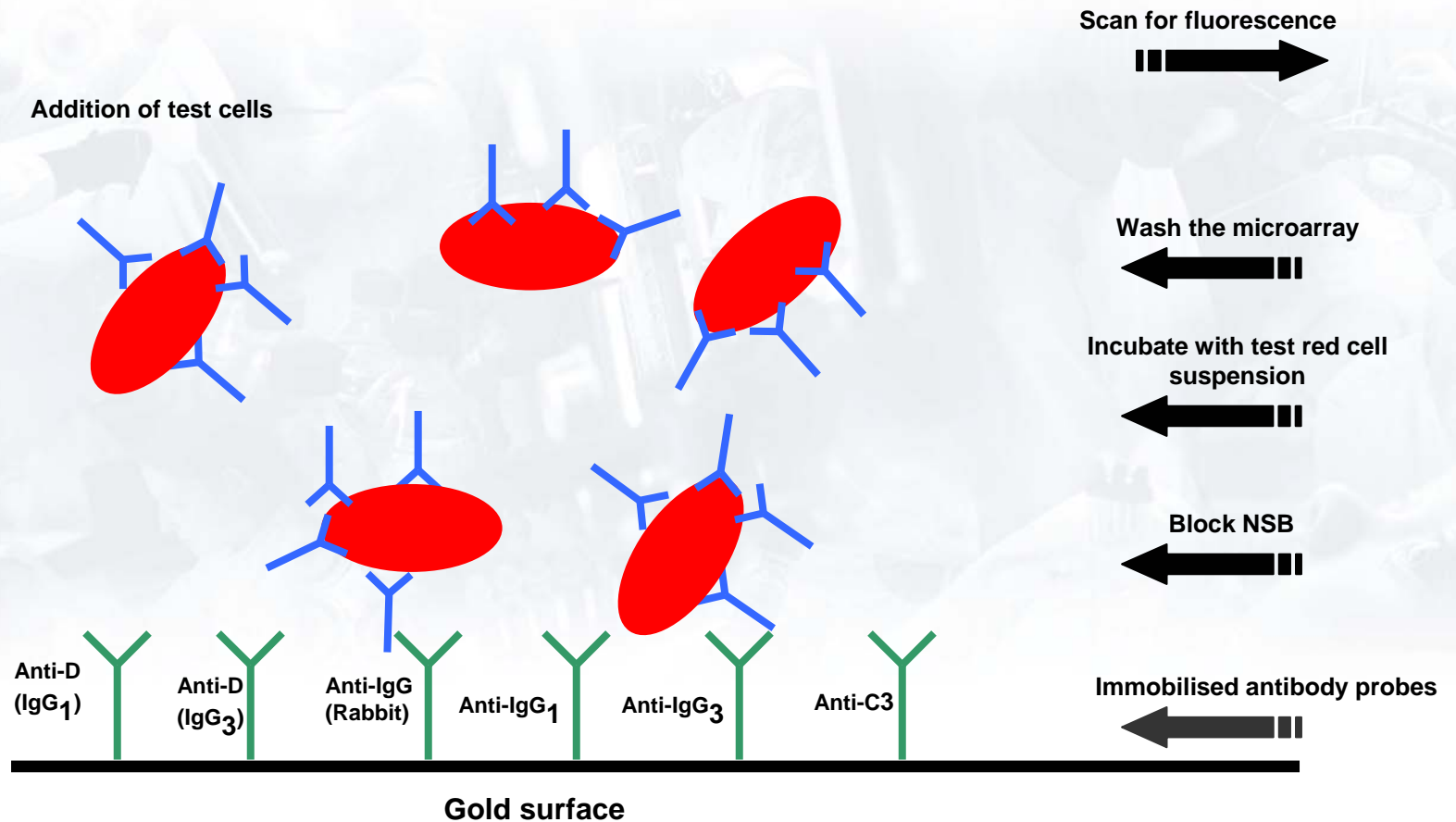
Design of the antibody screening microarray



* Immobilised antigen must represent clinically significant blood group antigens e.g. red cells/peptides/alternative source antigen

** Fluorescent detection antibody must bind to clinically significant human blood group antibodies e.g. anti-human IgG/IgM

Design of the DAT microarray



Manufacturing Considerations

- **Production of Antibodies**
 - monoclonal / polyclonal
 - purification methods
 - IgM/IgG
 - Specificity/best probes
- **Production of Antigens**
 - antigen form
 - purification ?
- **Surface chemistry**

Manufacturing Considerations

- **Process Scale-Up & Validation**
- **Stability of components (bulk storage, finished product)**
- **Resources**
 - Facility
 - Equipment - High throughput printing
- **Quality Control**

Development and Regulatory Strategy...1

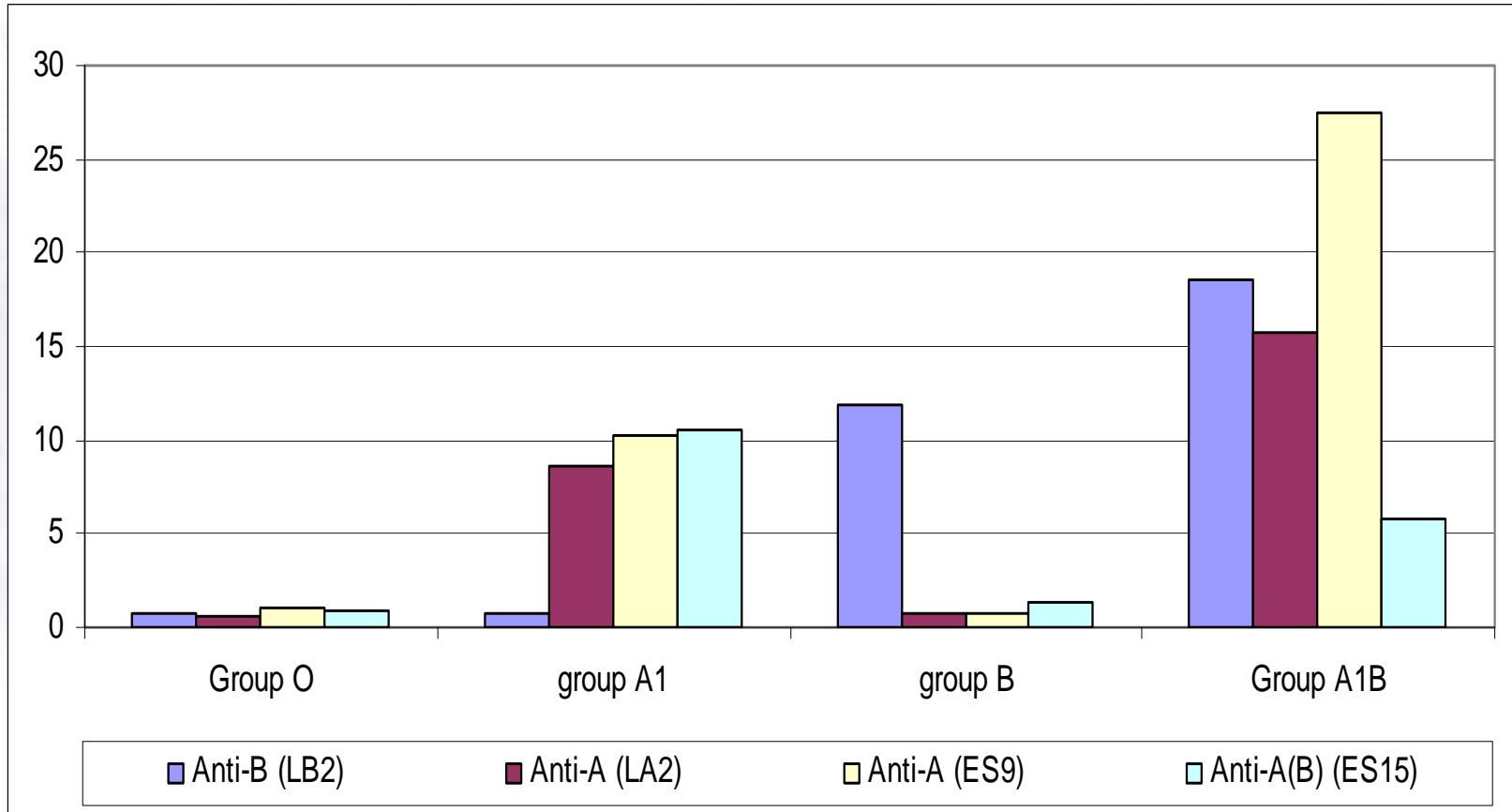
- Fully optimise all aspects of comprehensive microarraying platform
- Phased launch to market
- Package developed in collaboration
- Field trials, validation and verification of platform
- Test purchase controlled by software

- Compliance with and approval by regulatory bodies
 - ISO 13485
 - European IVD Medical Devices Directive

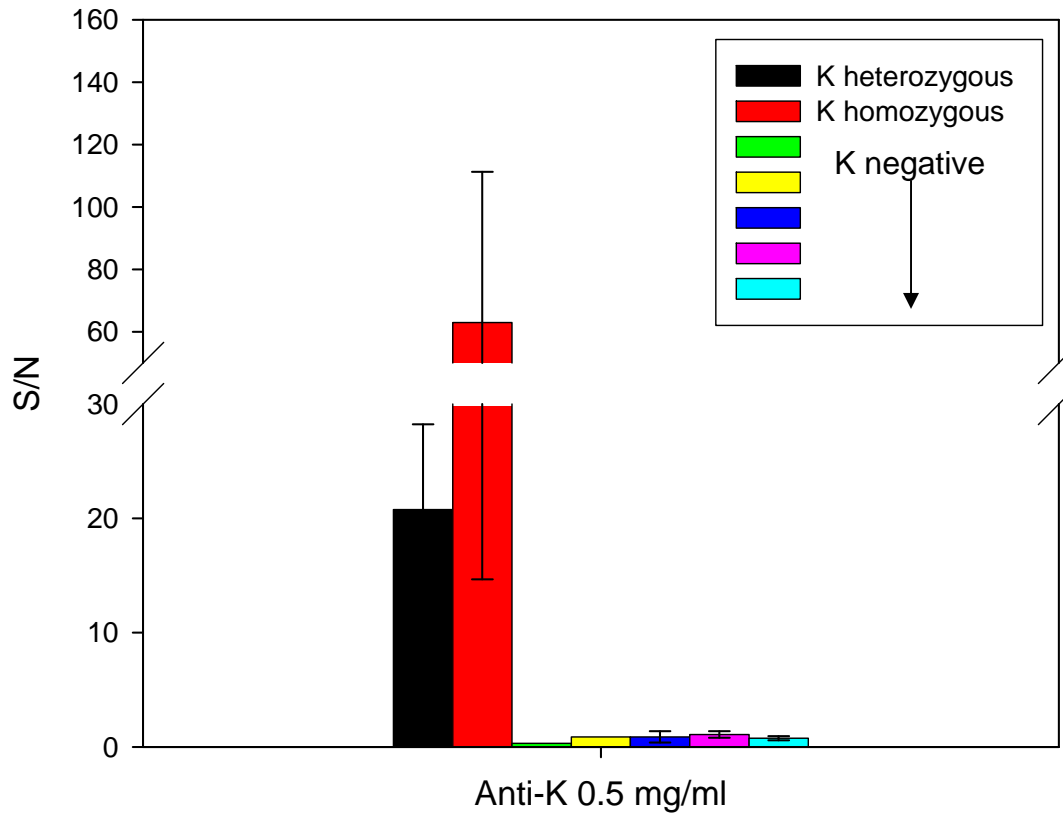
Development and Regulatory Strategy...2

- In the US...
 - FDA Center for Devices and Radiological Health is the lead authority for equipment submissions
 - FDA Center for Biologics Evaluation and Research is lead authority for biological submissions
- Equipment normally cleared first (instrument and software) and is normally submitted by equipment manufacturer.
- However, combination product applications can be accepted
- Each case reviewed by FDA and best route agreed
- Software validation is likely to be the most complex step in the validation (minimised by limited chip options)
- Related guidance listed in July 2007 issue of Transfusion.

Preliminary results – blood typing

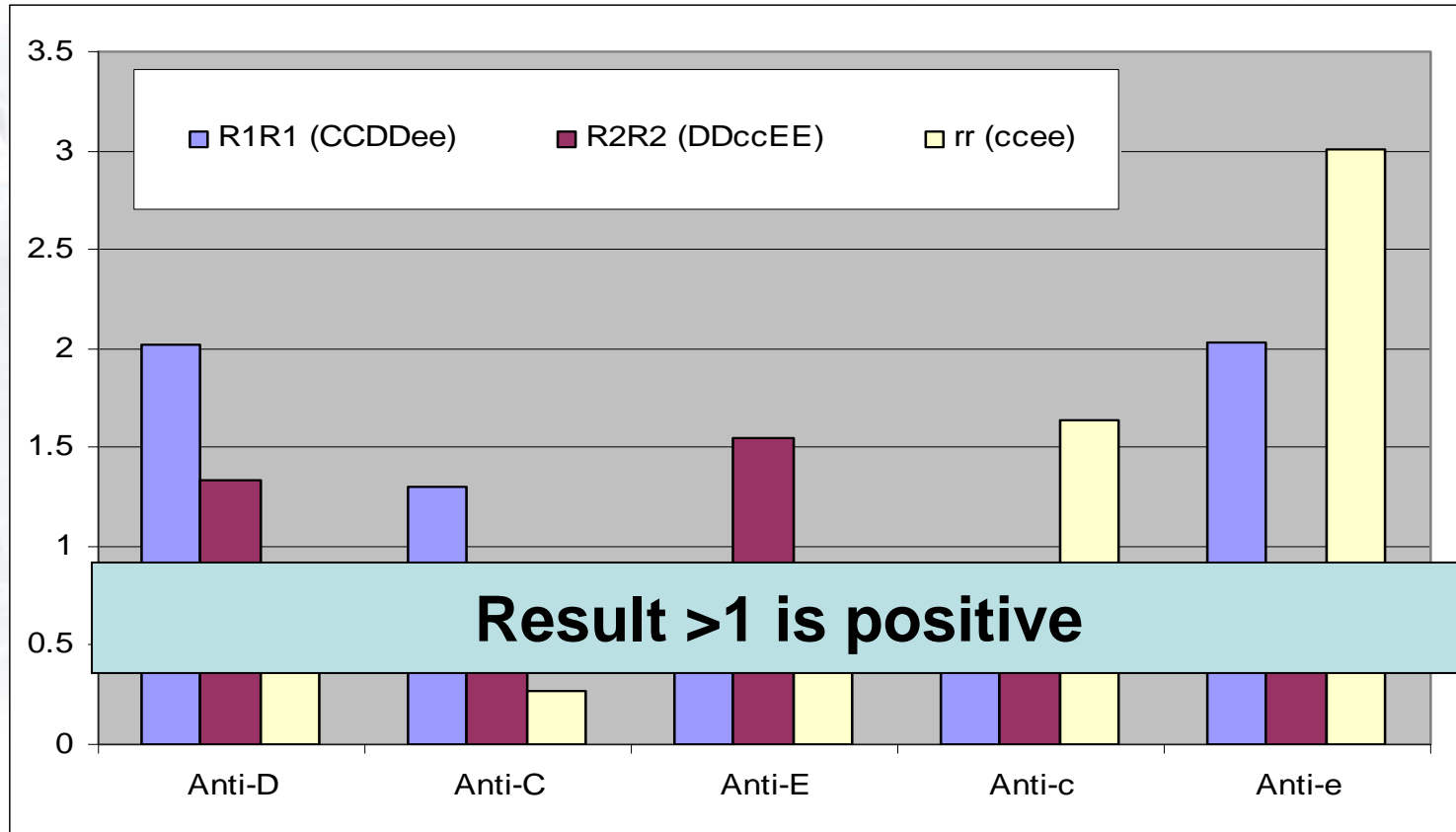


Preliminary results – blood typing



Probe antibody specificity and concentration

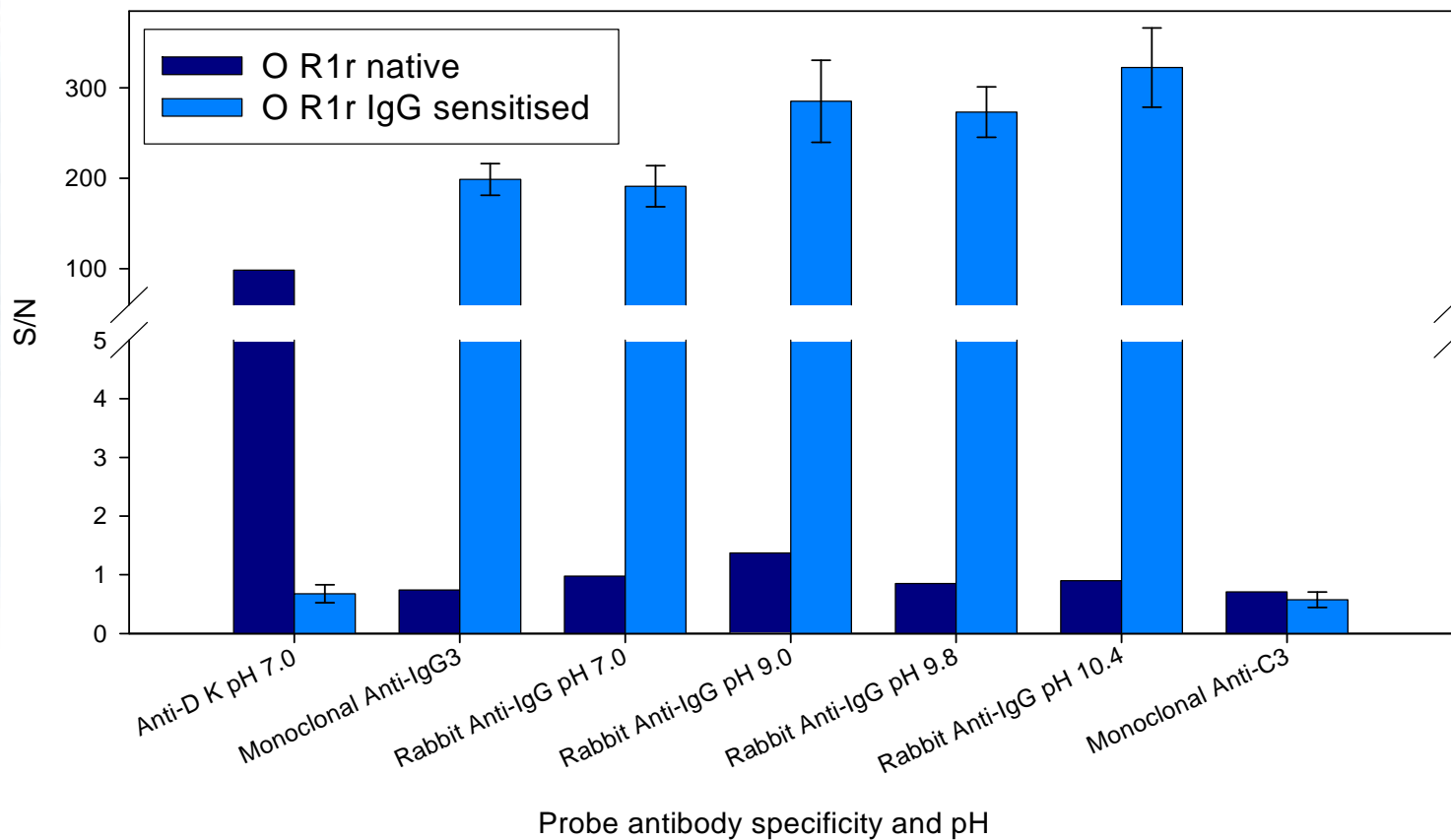
Preliminary results – antibody screening



Red cell membrane fragments immobilised on proprietary surface, antibodies added and detected by addition of anti-human IgG/IgM

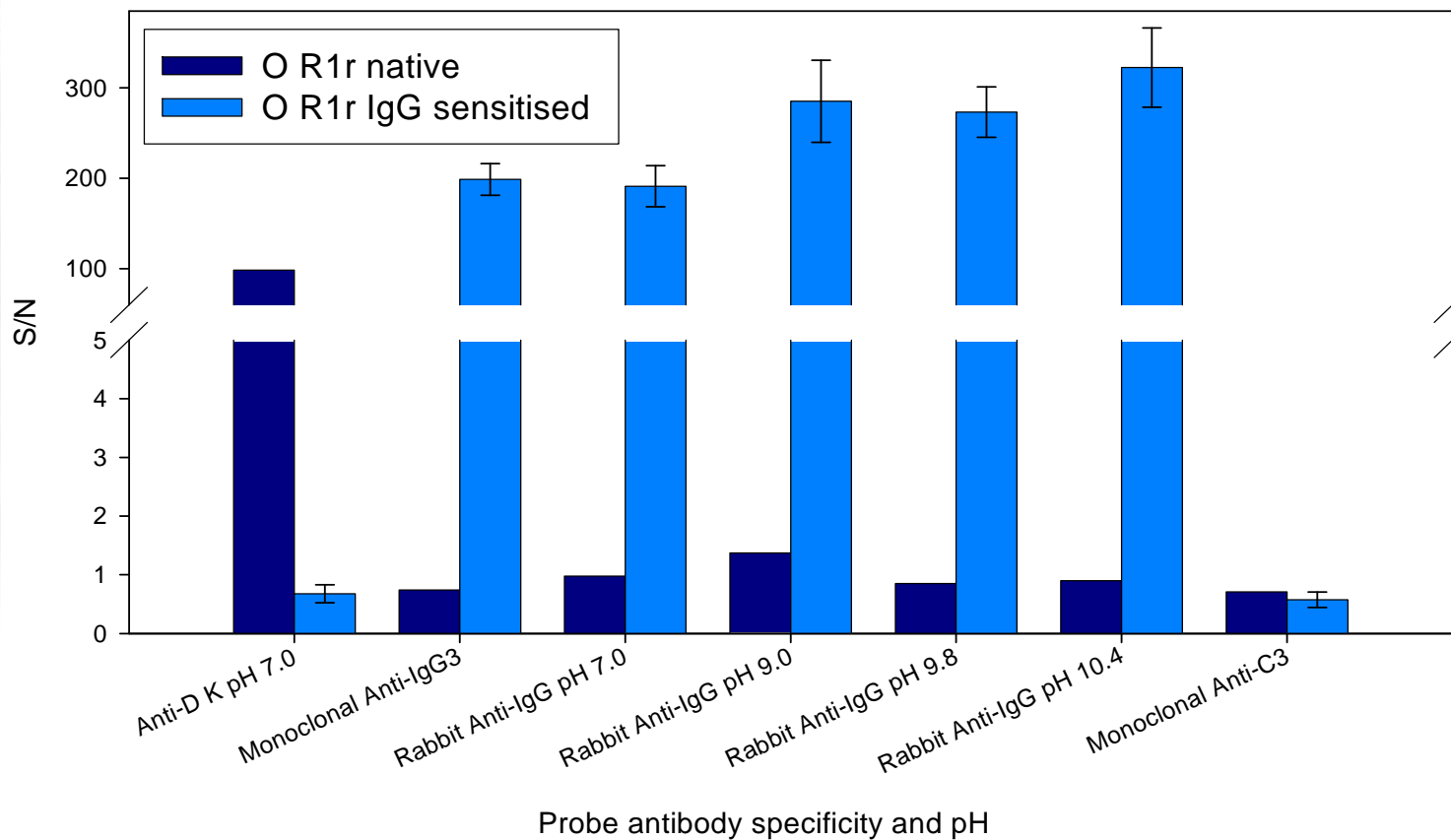
Preliminary results – direct antiglobulin testing

R₁r sensitised with IgG₃ anti-D



Preliminary results – direct antiglobulin testing

R₁r sensitised with IgG₃ anti-D



Acknowledgements

- **Alba Bioscience – Product Development**
Dr Janine Robb, Linda Knowles
- **Scottish National Blood Transfusion Service**
Dr Juraj Petrik and his Transfusion Transmitted Infection R&D Group
- **University of Edinburgh**
Department of Pathway Medicine (formerly SCGTI)
- **Scottish Enterprise**



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