

Use of an **anti-HBc** **confirmatory assay** in the transfusion medicine setting

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Panning

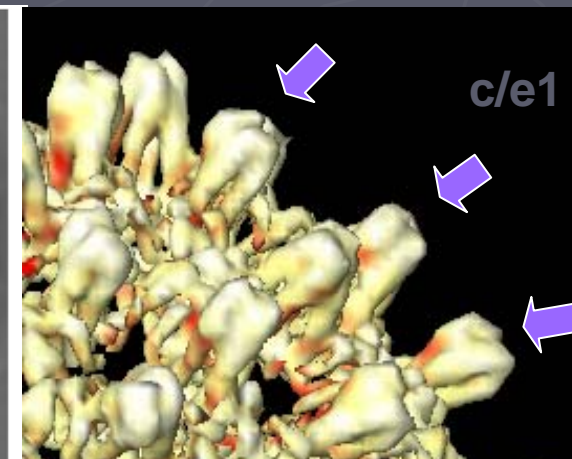
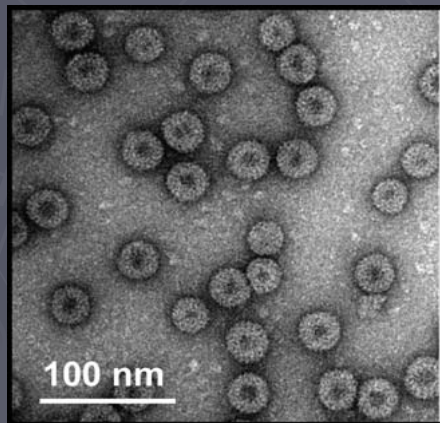
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Objectives

- ▶ Since 2006 anti-HBc testing of donors mandatory in Germany
- ▶ Anti-HBc reactive donations
 - are tested for anti-HBs and HBV-DNA
 - are deferred
- ▶ Anti-HBc reactive donors
 - are deferred if anti-HBs < 100 IU/l
- ▶ Confirmation of reactivity with other assays
 - high number of discrepant results

The idea (Wolfram Gerlich)

- ▶ Use of recombinant HBcAg in an inhibition assay
- ▶ Recombinant HBcAg provided by Michael Nassal, Dept. of Internal Medicine



3D detail: spikes contain immunodominant c/e1 epitope



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My Favourite Essay

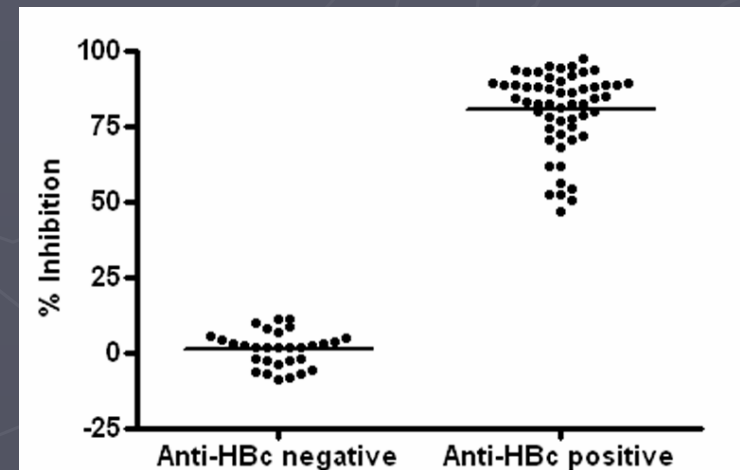
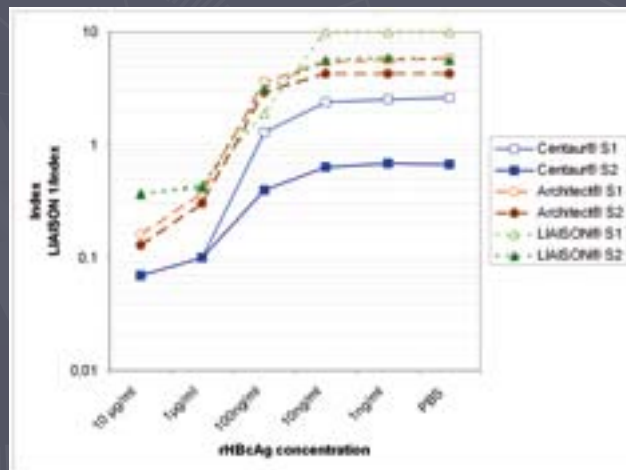
Simple confirmatory assay for anti-HBc reactivity

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How the assay works

- ▶ Like HBsAg confirmatory assay
- ▶ 1 h preincubation with ag/PBS (10 μ l/190 μ l)
- ▶ Run assay as usual
- ▶ Calculate percentage of inhibition
- ▶ Inhibition of >45% reactivity confirmed
- ▶ Inhibition of <30% reactivity not confirmed
- ▶ Results between 30 and 45 % as unresolved

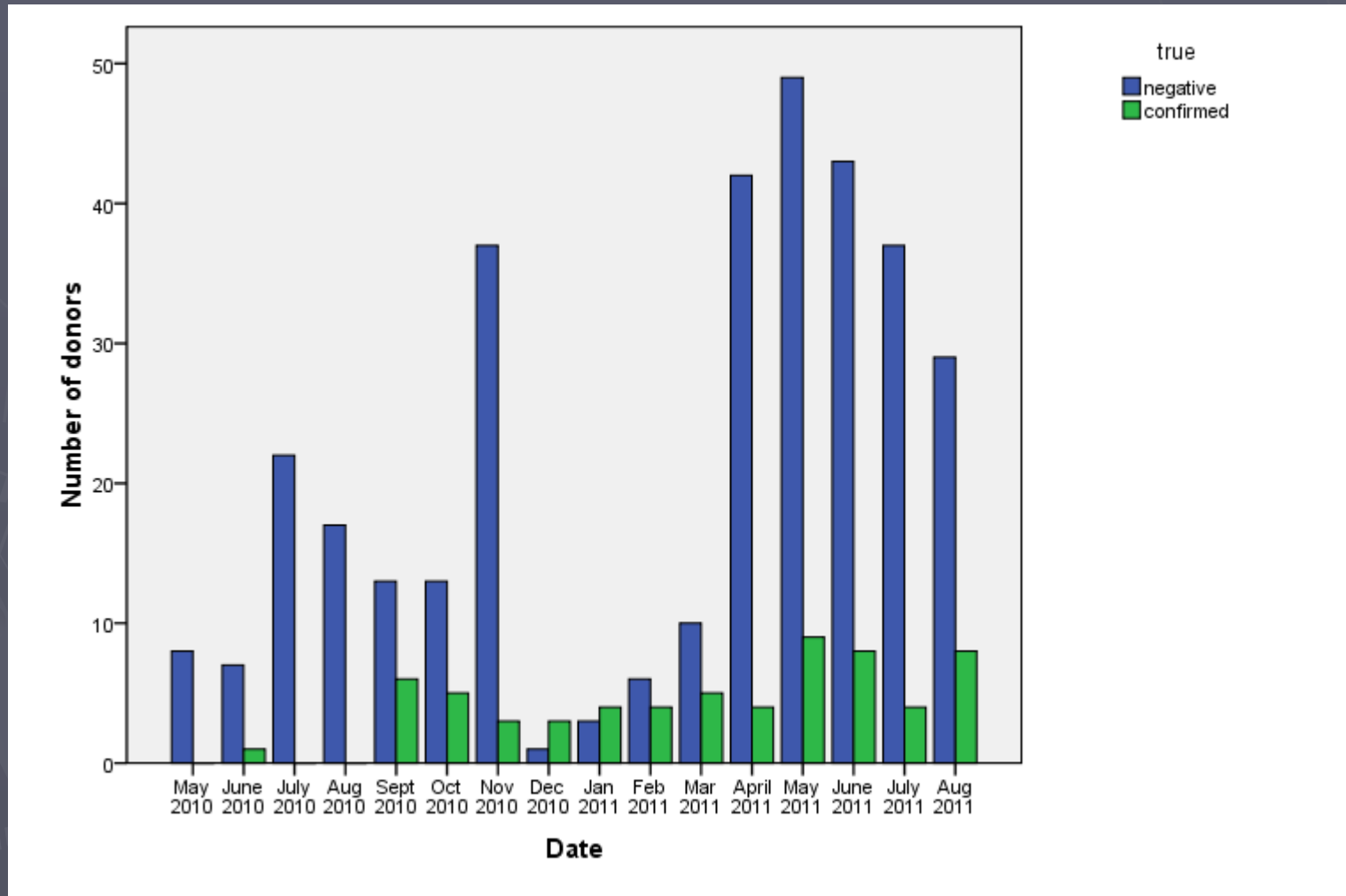
The study

- ▶ Since May 2010 prospective testing of all donor samples with repeat reactivity in the department of transfusion medicine (Abbott Architect i2000)
 - Anti-HBc Architect i1000
 - Anti-HBc Centaur (Siemens)
 - Anti-HBs Centaur
 - Confirmatory assay where applicable

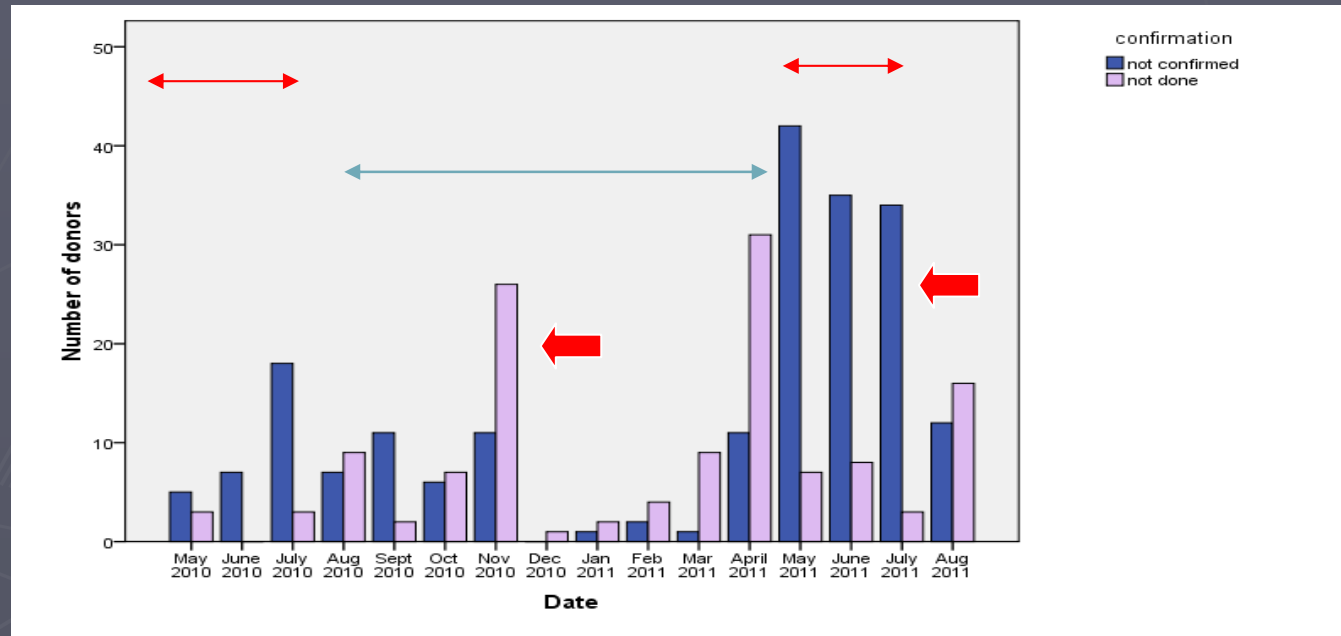
Results

- ▶ 406 samples from 47565 donations (0,9%)
- ▶ 131 samples negative in Architect i1000
 - In 35 cases Index 0.7-0.99: confirmatory applied and negative
- ▶ 203 confirmatory assay negative (Inhibition -9 – 25%)
 - 201/203 clearly negative in Centaur anti-HBc
 - 2/203 reactive in Centaur anti-HBc but negative in Architect i1000
- ▶ 67 confirmed positive (Inhibition 69-97%)
 - 6 negative in Centaur anti-HBc
- ▶ 5 unresolved sera from 3 donors (Inhibition 33-44%)

Number of negative and confirmed positive results per month



Lot dependency

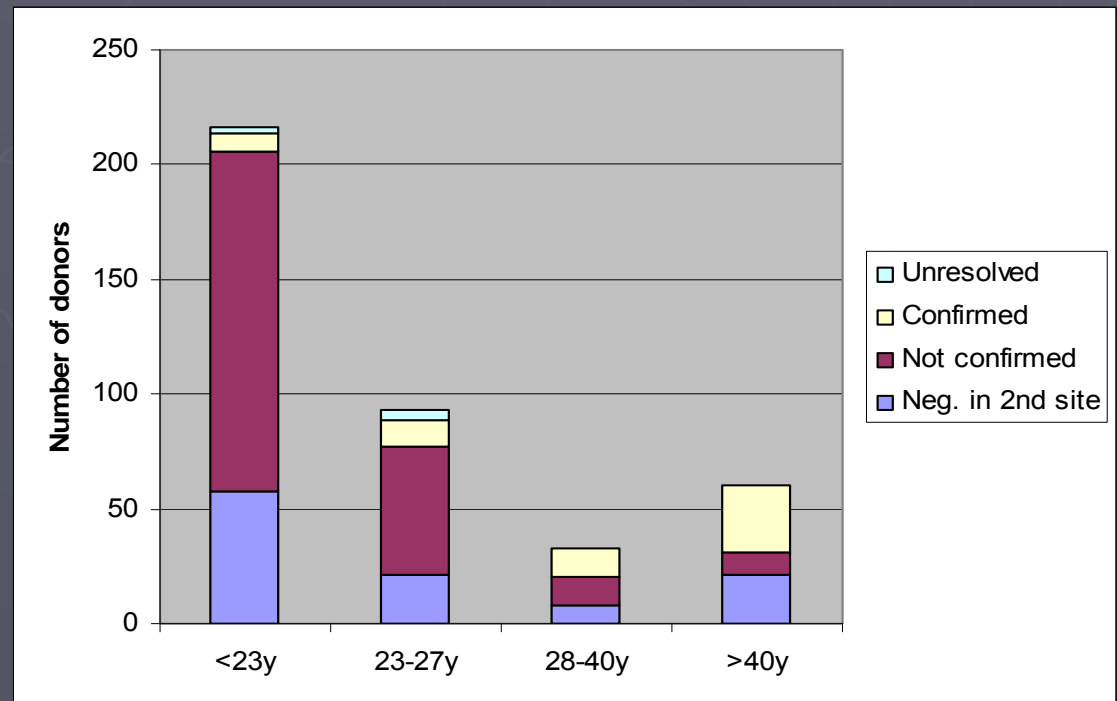


- ▶ 49 donors gave second sample
- ▶ 21 samples negative with new test lot

Age of donors

Mean age

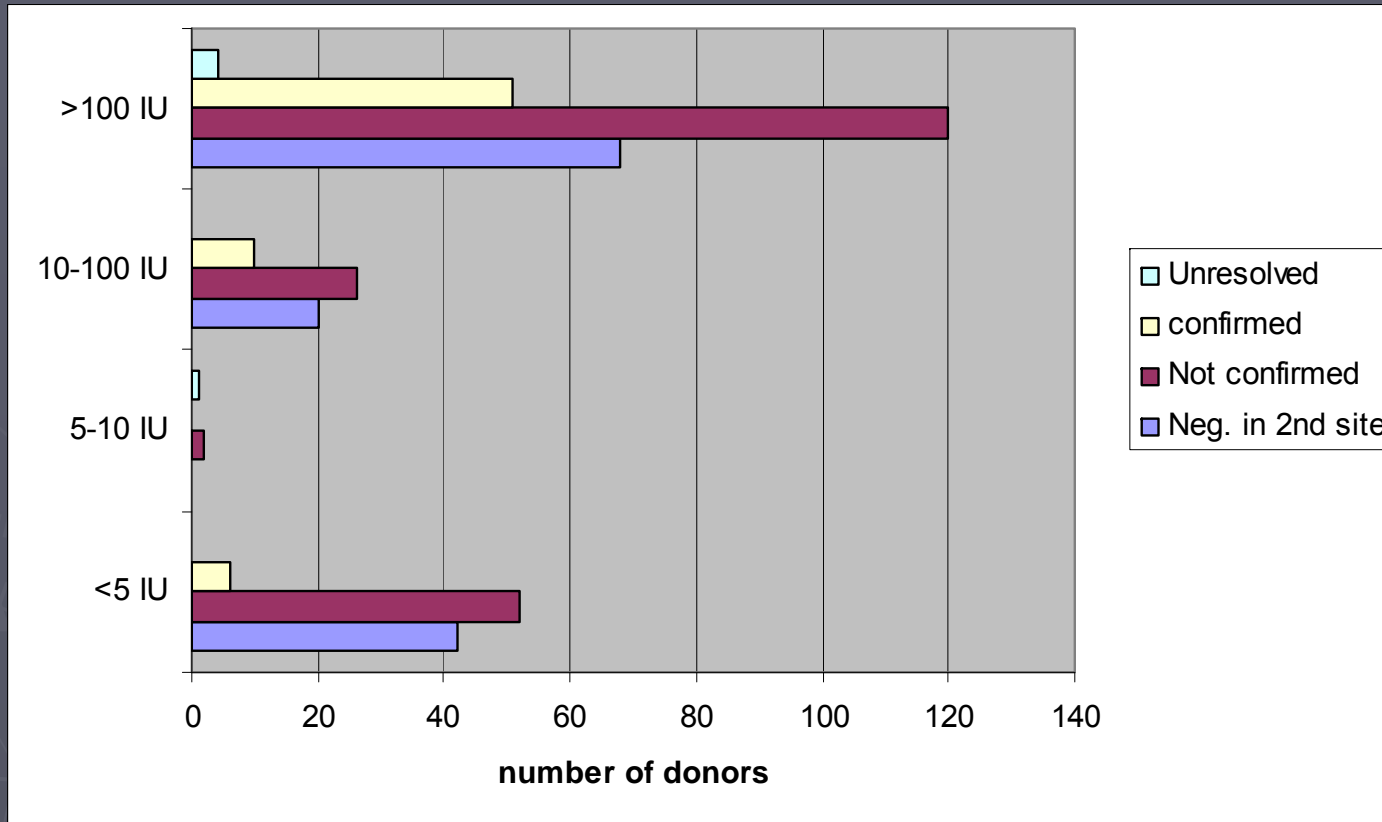
- ▶ All donors: 33y
- ▶ confirmed positive donors: 38y
- ▶ not confirmed donors: 23y



Positive predictive values

- ▶ Calculated specificity: 99,3% (339/47565 false positive results)
- ▶ Sensitivity estimated at 95%
- ▶ Overall PPV: 17%
- ▶ >40 years: 51%
- ▶ 28-40 years: 42%
- ▶ 23-27 years: 15%
- ▶ <23 years: 4%

Anti-HBs



- >70% of donors with unconfirmed result anti-HBs +
- In most algorithms positive anti-HBs = confirmed result

Seroconversions?

- ▶ 211 samples from repeat donors
 - Look-back testing: 140€/donor
- ▶ 9 confirmed reactive samples
- ▶ 4 true seroconversions
 - PCR in all 4 samples and look-back negative
 - Anti-HBs >1000 IU/l
- ▶ 5 donors age >40y, last donation before 2006 (first anti-HBc assay)

Conclusion

- ▶ Anti-HBc confirmatory assay is easy to apply and has clearcut results
- ▶ Most „seroconversions“ are false reactive results and due to measurement in different test lots
- ▶ Measurement in different assay can lead to false negative result
- ▶ Anti-HBc-testing in vaccinated people of limited value
 - Vaccination status should be asked

Thanks to...

- ▶ Wolfram Gerlich (Virology Giessen)
- ▶ Michael Nassal
- ▶ Jolanta Vorreiter (Dept. Medicine)
- ▶ Florian Emmerich, Markus Umhau, Doreen Grundke (Dept. Transfusion Medicine)
- ▶ Christina Fritz, Christine Männer (Technicians)
- ▶ Valeria Falcone, Marcus Panning (colleagues)
 - ... and you for your attention