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SIAB receives support from WADA, USADA, Australian Government & Anti Doping Danmark.

Blood testing: pushing the envelope
A decade of advances, and false dawns...

<table>
<thead>
<tr>
<th>1998</th>
<th>2008</th>
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<tbody>
<tr>
<td>“We need more funding”</td>
<td>Adequate funding</td>
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<td>“We need a common set of rules, banned lists &amp; penalties”</td>
<td>WADA Code</td>
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<tr>
<td>“We need Government &amp; law enforcement”</td>
<td>BALCO (steroids)</td>
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<td>Puerto (transfusion)</td>
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<td>Torino (transfusion)</td>
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History of autologous transfusion

- ‘Discovery’
  - in 1972 studies show athletic performance improved by ~20%
- 12 years later
  - US cycling team use transfusions to win multiple medals at 1984 Los Angeles Olympics
- 34 years later
  - Puerto documents reveal widespread use of autologous transfusion
Changes in blood parameters after autologous transfusion

Phlebotomy of 1.3L whole blood (~20% of total volume)
Reinfusion of 0.8 L of packed RBC
Conformational change in receptor stimulates EPO production

Some examples:
- CERA
- SEP
- EPO fusion proteins
- EPO-GM-CSF
- Fc-EPO
- CTNO 528
- Hematide

From Bunn (2007). Blood 109 (3) p868-8
EPO

‘EPO gene produces circulating hormone’

HIF stabilisers
- easy to synthesise
- 20+ products

GATA inhibitors
- Numerous
- Oral route

see Bunn (2007). Blood 109 (3) p868-873
What of blood testing in the future?

- Markers that provide *indirect* evidence of doping

- The *landscape* for blood testing will be radically different...or apocalyptic???
1. Ban team-based medical staff

2. Introduce ‘NOLO’ (GPS-based ‘NOfication & LOcation’)

3. Review burden of proof
Conclusion

“Those who ignore history are condemned to repeat it”