Focus op functie: De milt als filter

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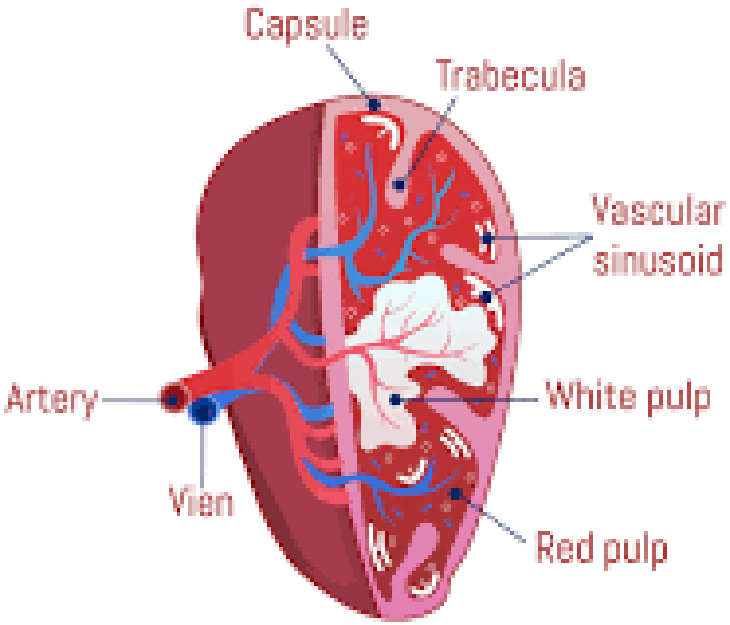
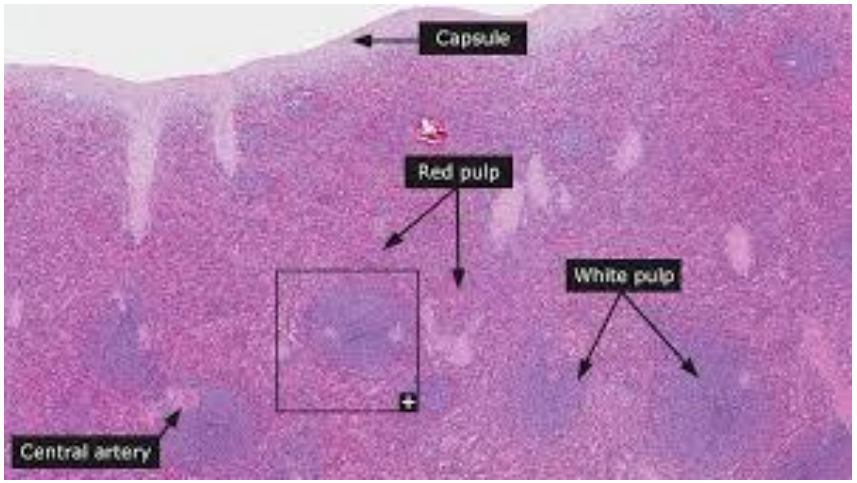
Havensymposium 2023

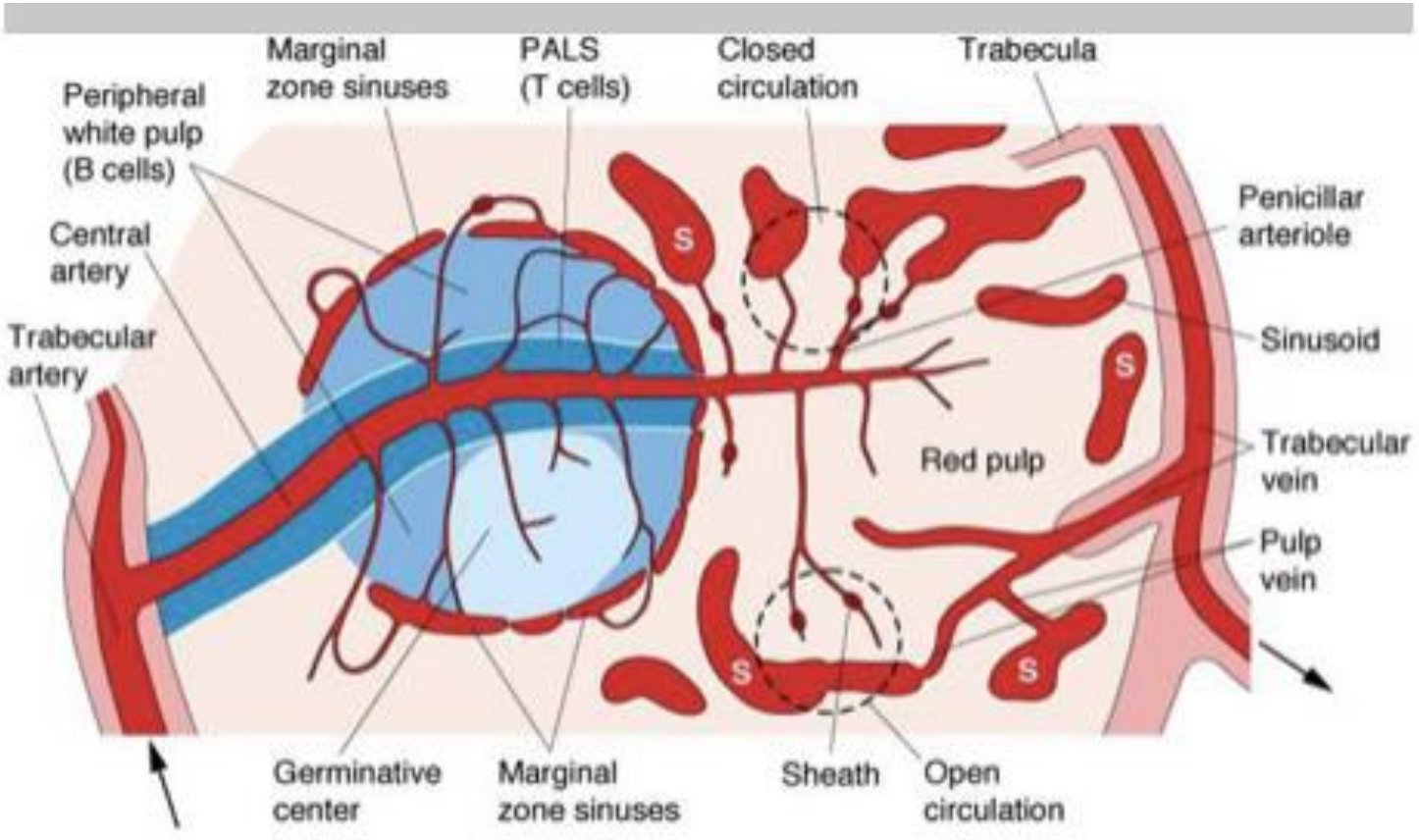
DE MILT | algemeen



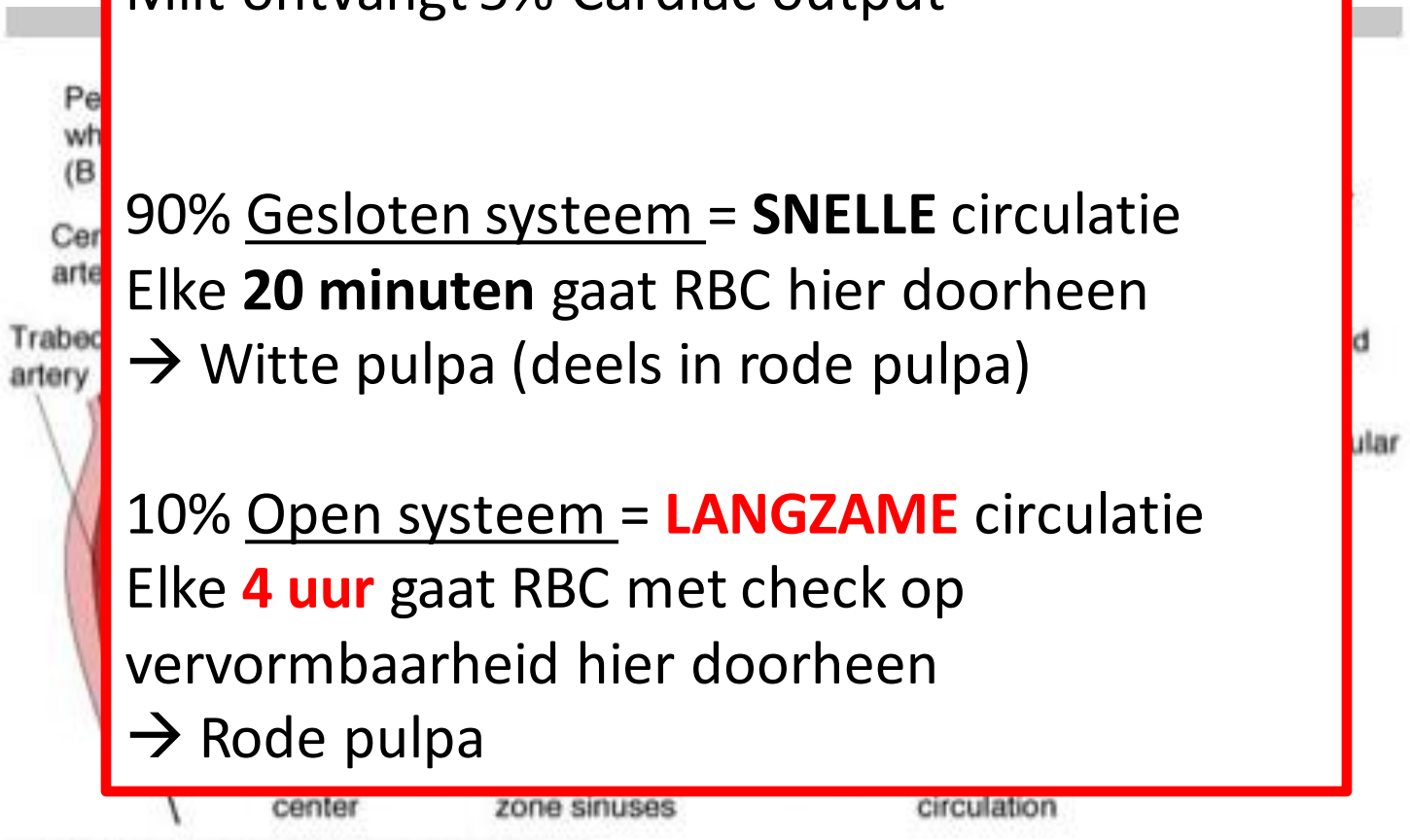


1. WITTE PULPA = afweer | RODE PULPA = filter
2. Er zit geen kapsel om de witte pulpa dus er is GEEN scheiding van bloedstroom door rode en witte pulpa (interactie verschillende functies is dus optimaal)

DE MILT | circulatie van bloed



DE MILT | circulatie van bloed

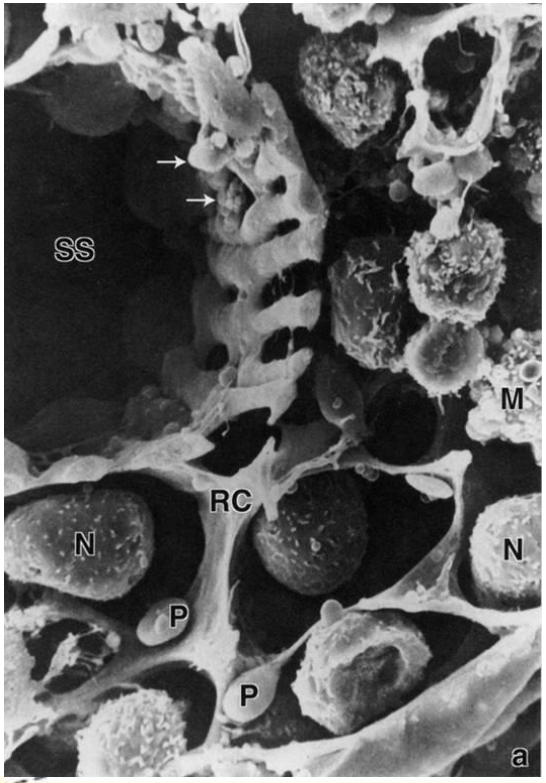


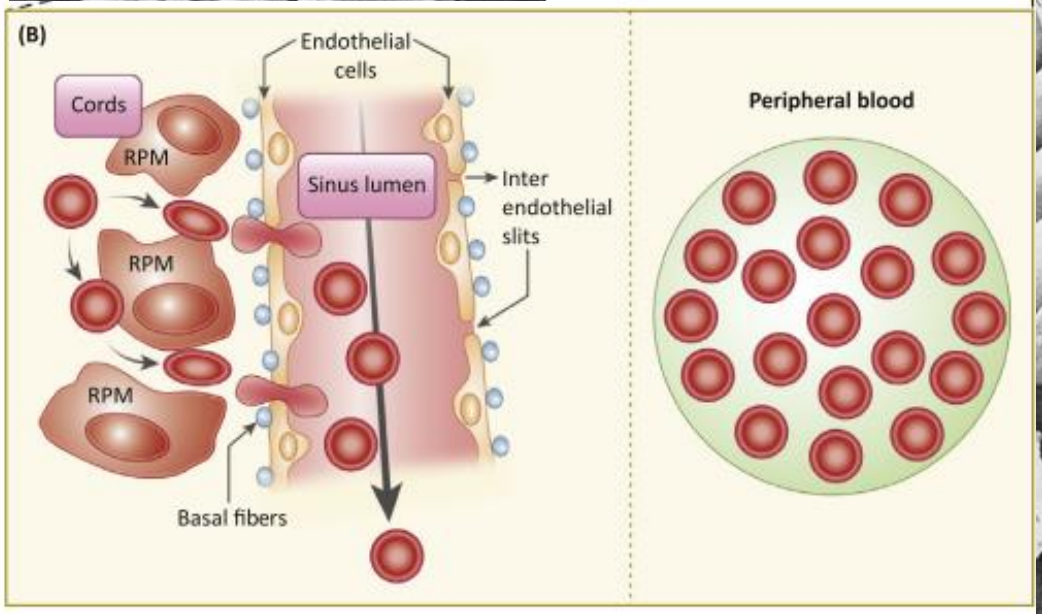
Milt ontvangt 5% Cardiac output

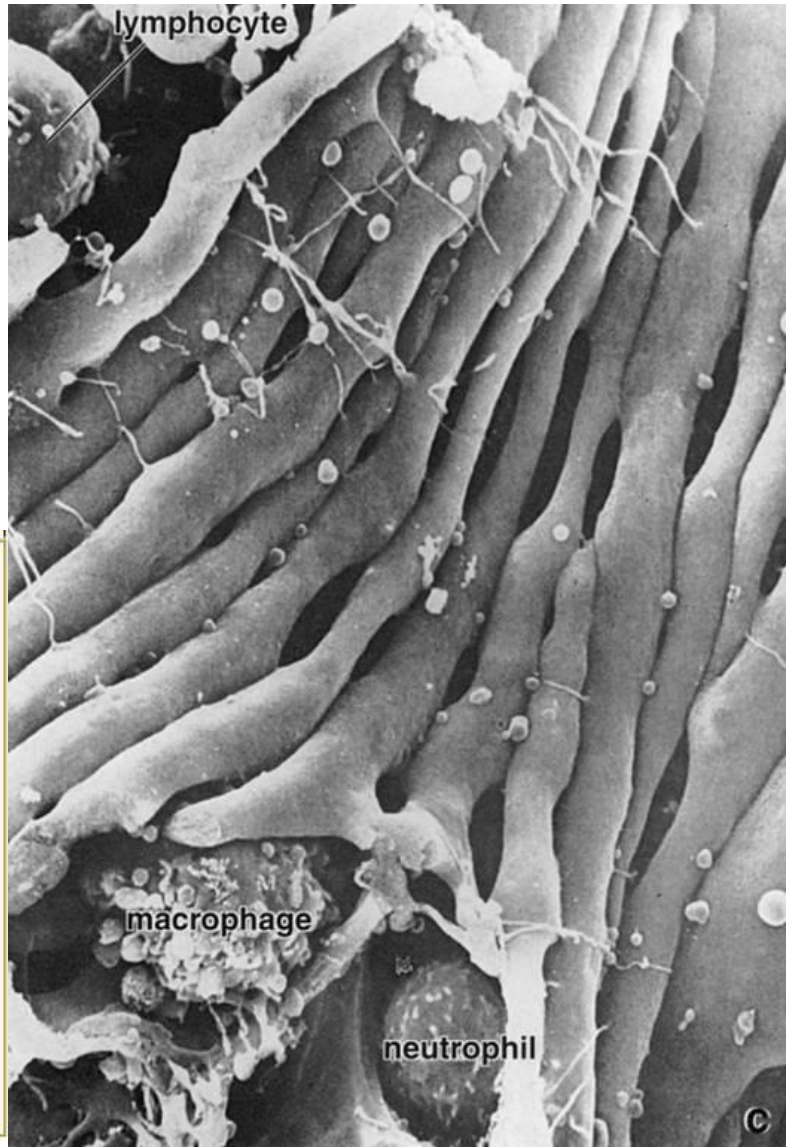
90% <u>Gesloten systeem</u> = **SNELLE** circulatie
Elke **20 minuten** gaat RBC hier doorheen
→ Witte pulpa (deels in rode pulpa)

10% <u>Open systeem</u> = **LANGZAME** circulatie
Elke **4 uur** gaat RBC met check op vervormbaarheid hier doorheen
→ Rode pulpa

Hoe doet de milt dat?







DE MILT | rode pulpa

Filtering van ‘alle’ RBCs met **afwijkende vorm** of **flexibiliteit**

- Oude RBCs
- Geïnfecteerde RBCs
- Disfunctionele RBCs
- Opsonisatie door antistoffen of complement

Door macrofagen uit rode pulpa verwijderd waarbij ijzer gerecycled wordt

Wat gebeurt er dan bij malaria?

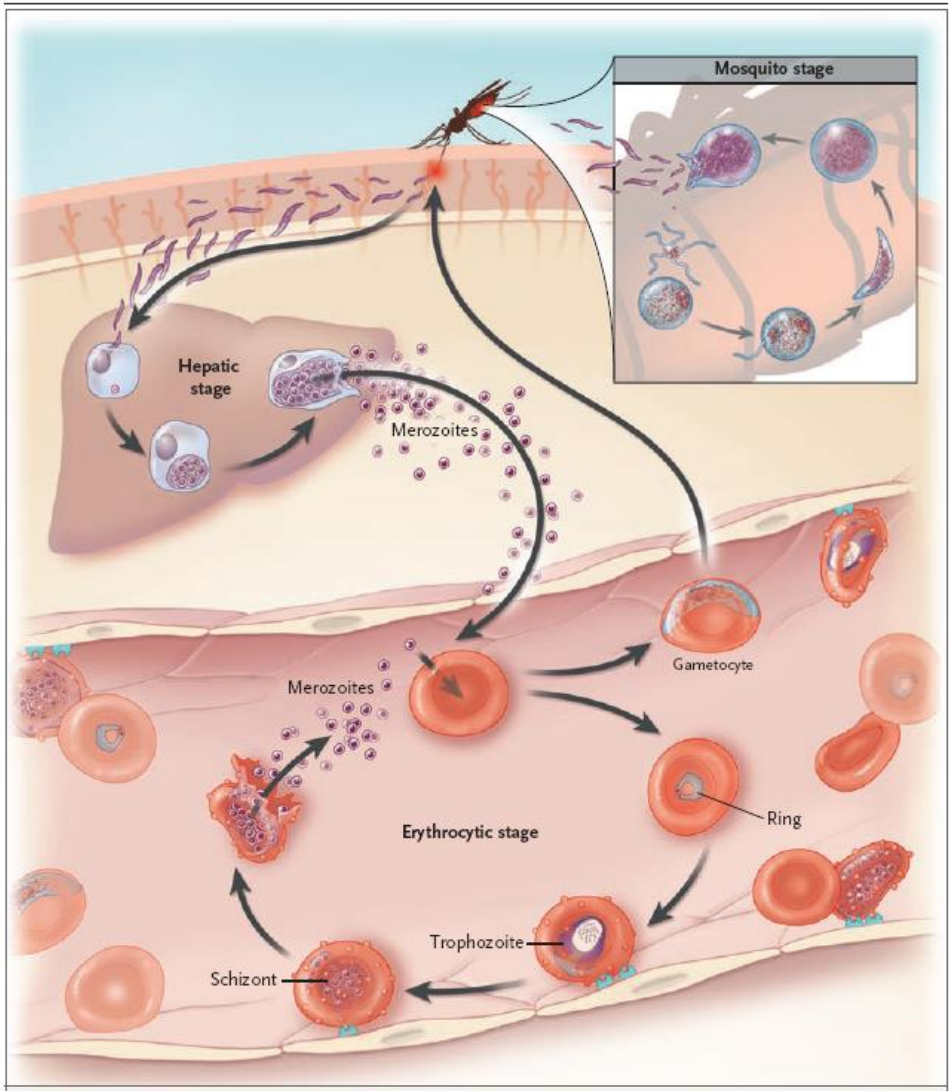
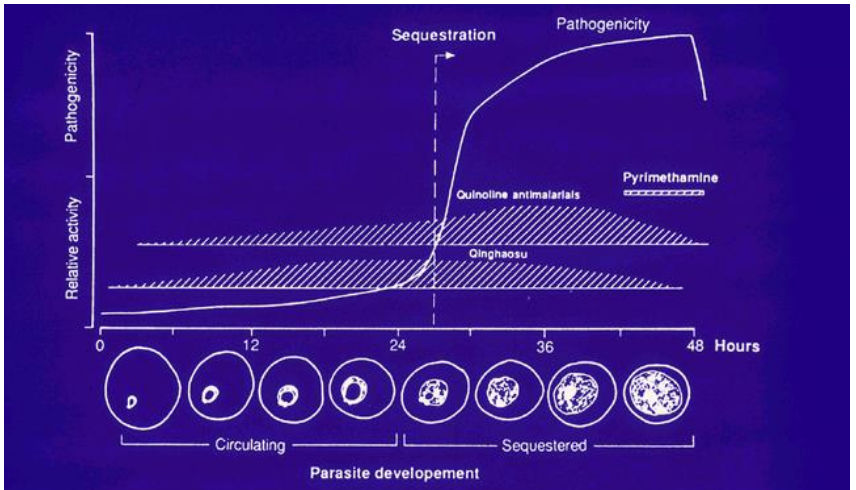
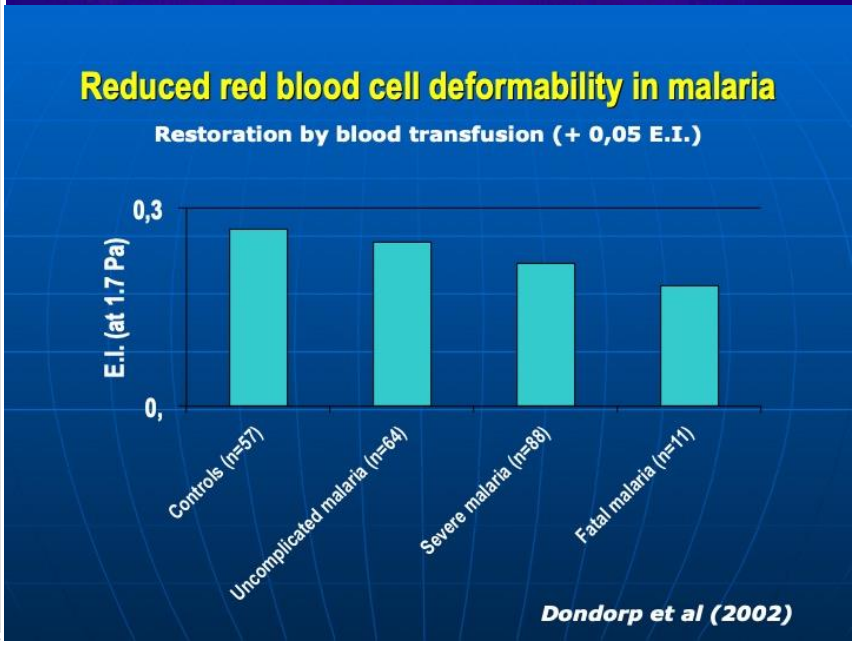


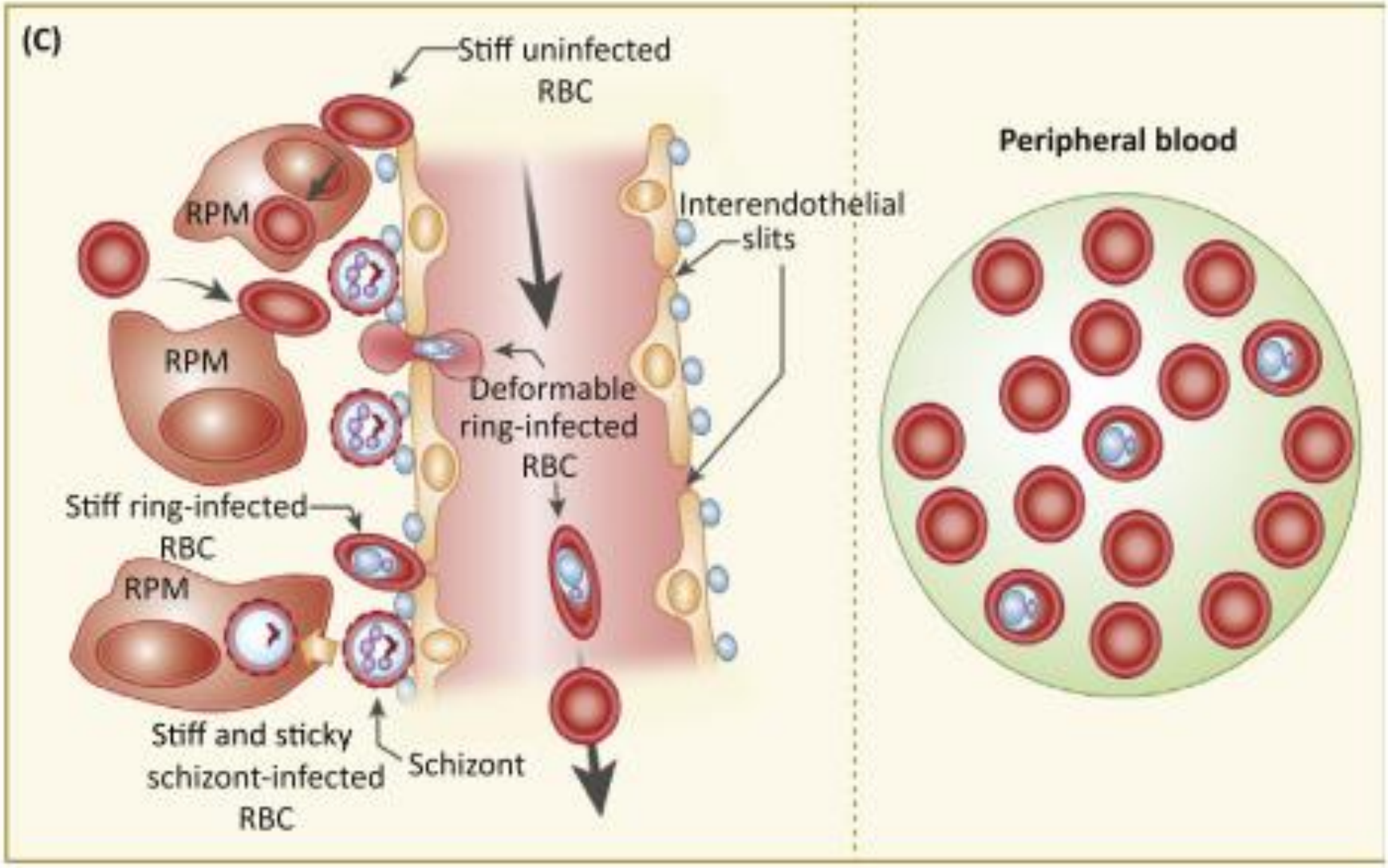
Figure 1. Life Cycle of *Plasmodium falciparum*.
Elements that are important for the pathogenesis of severe malaria are shown. Erythrocytes containing *P. falciparum* in mature intraerythrocytic stages (trophozoites and schizonts) adhere to vascular endothelium, thereby avoiding clearance by the spleen. High numbers of circulating parasites and elaboration of host and parasite factors in the vasculature of various organs lead to the manifestations of severe malaria.



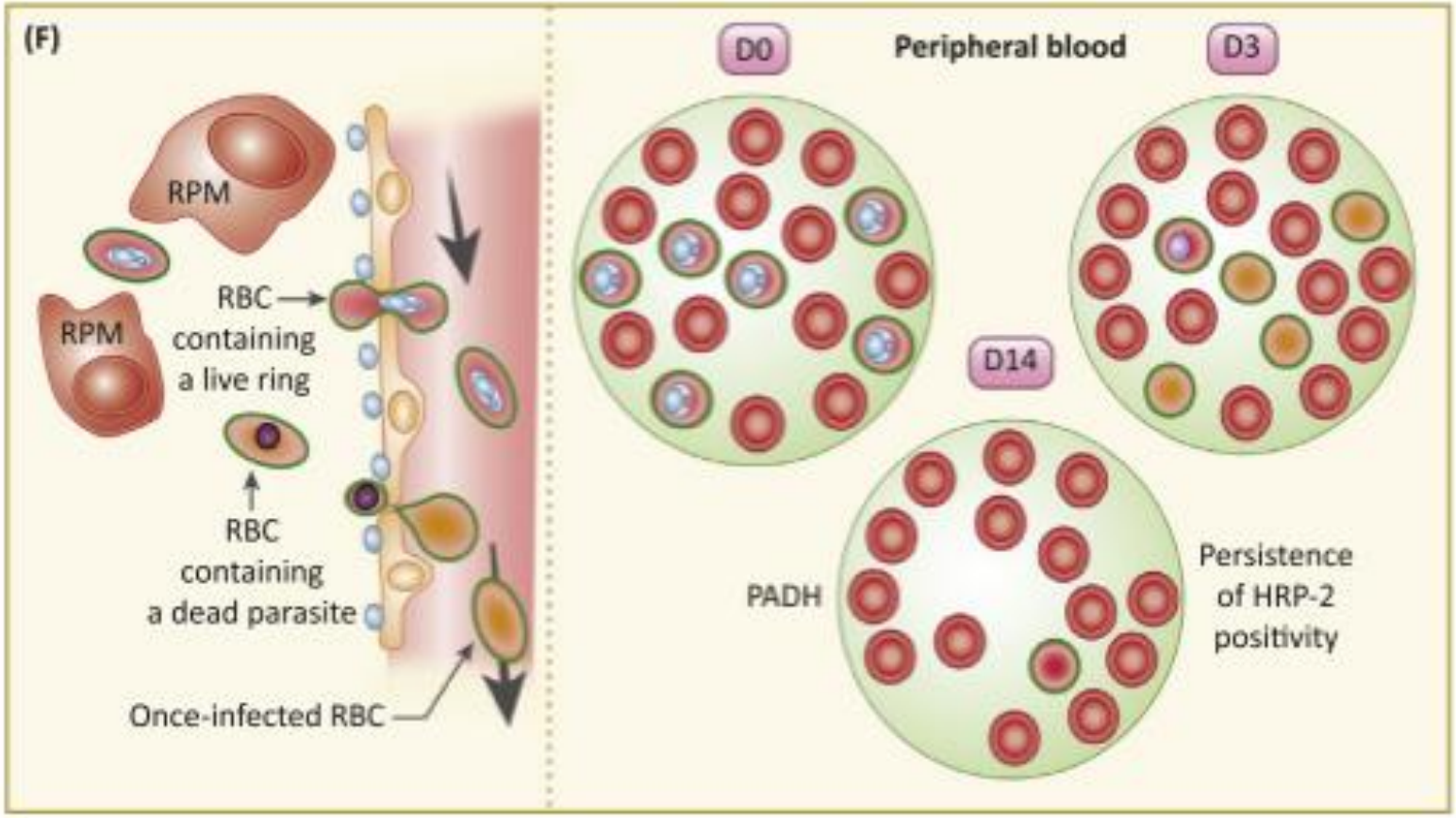
Stage of parasite development and pathogenicity with rough estimates of stage specificity and 'time windows' of anti-malarial drug effects.

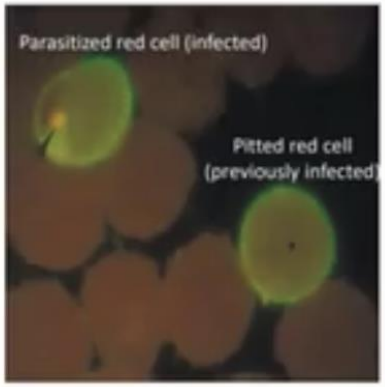


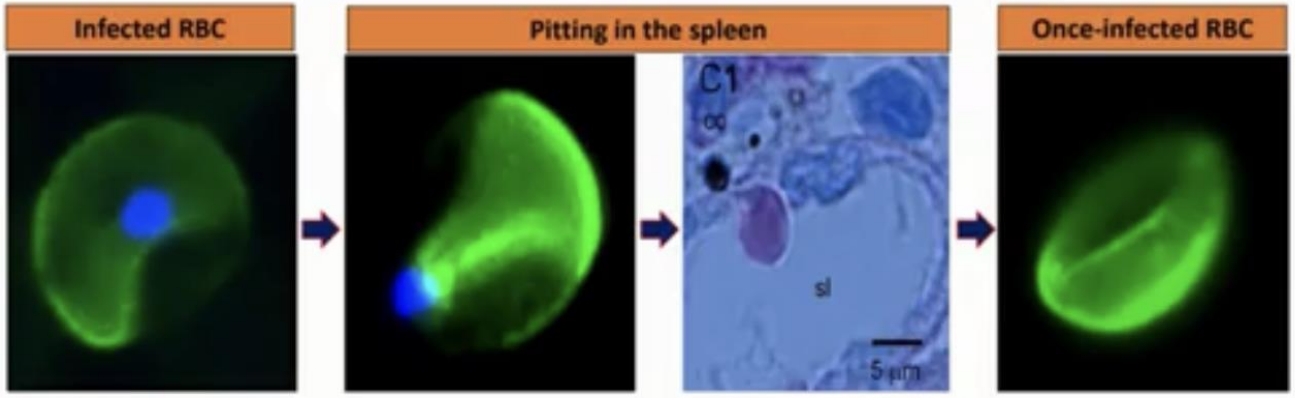
Alleen vervormbare RBC passeren filter



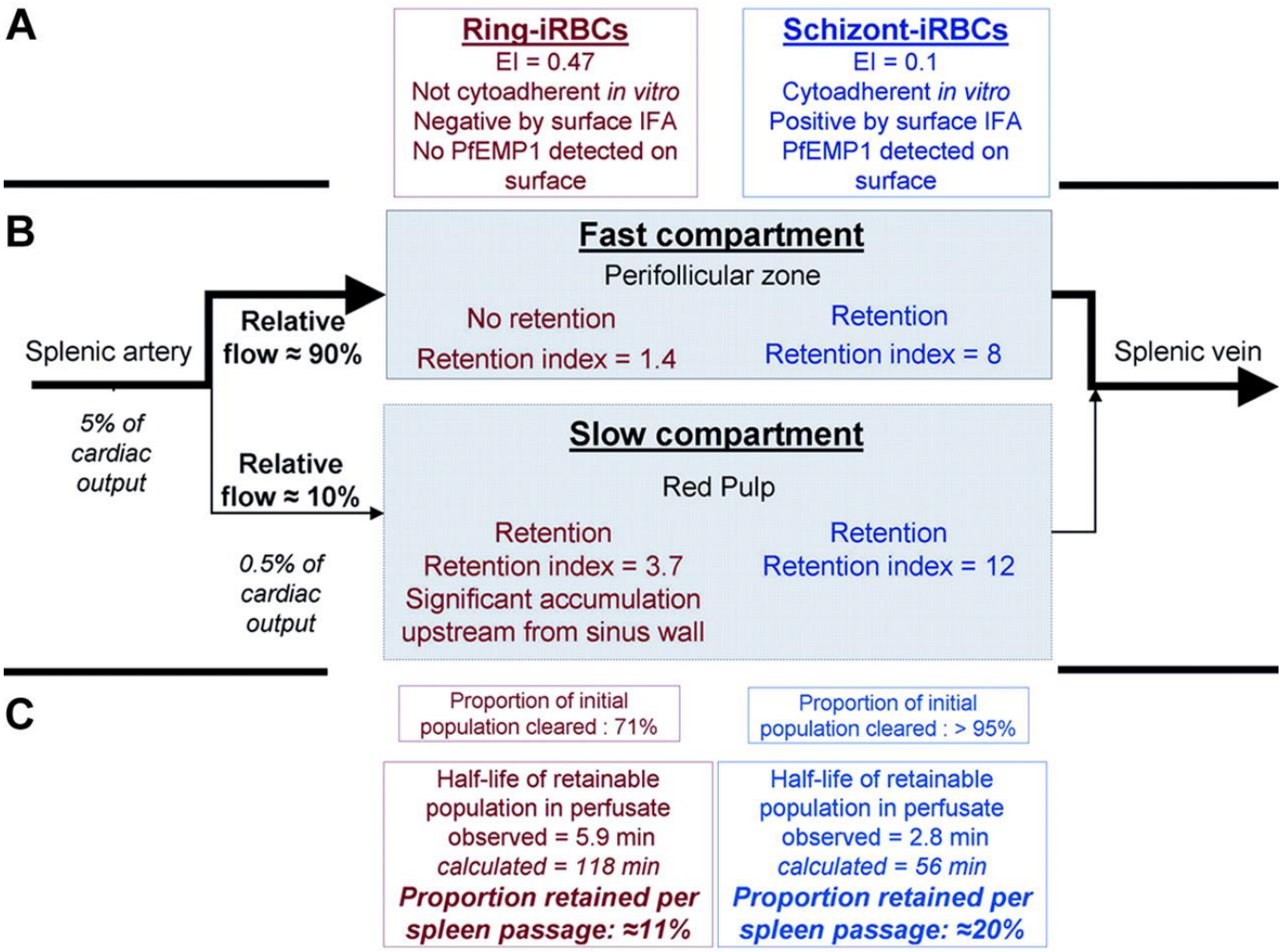
PITTING


(F)
RPM
RPM
RBC containing a live ring
RBC containing a dead parasite
Once-infected RBC
D0
Peripheral blood
D3
D14
PADH
Persistence of HRP-2 positivity


Parasitized red cell (infected)
Pitted red cell (previously infected)

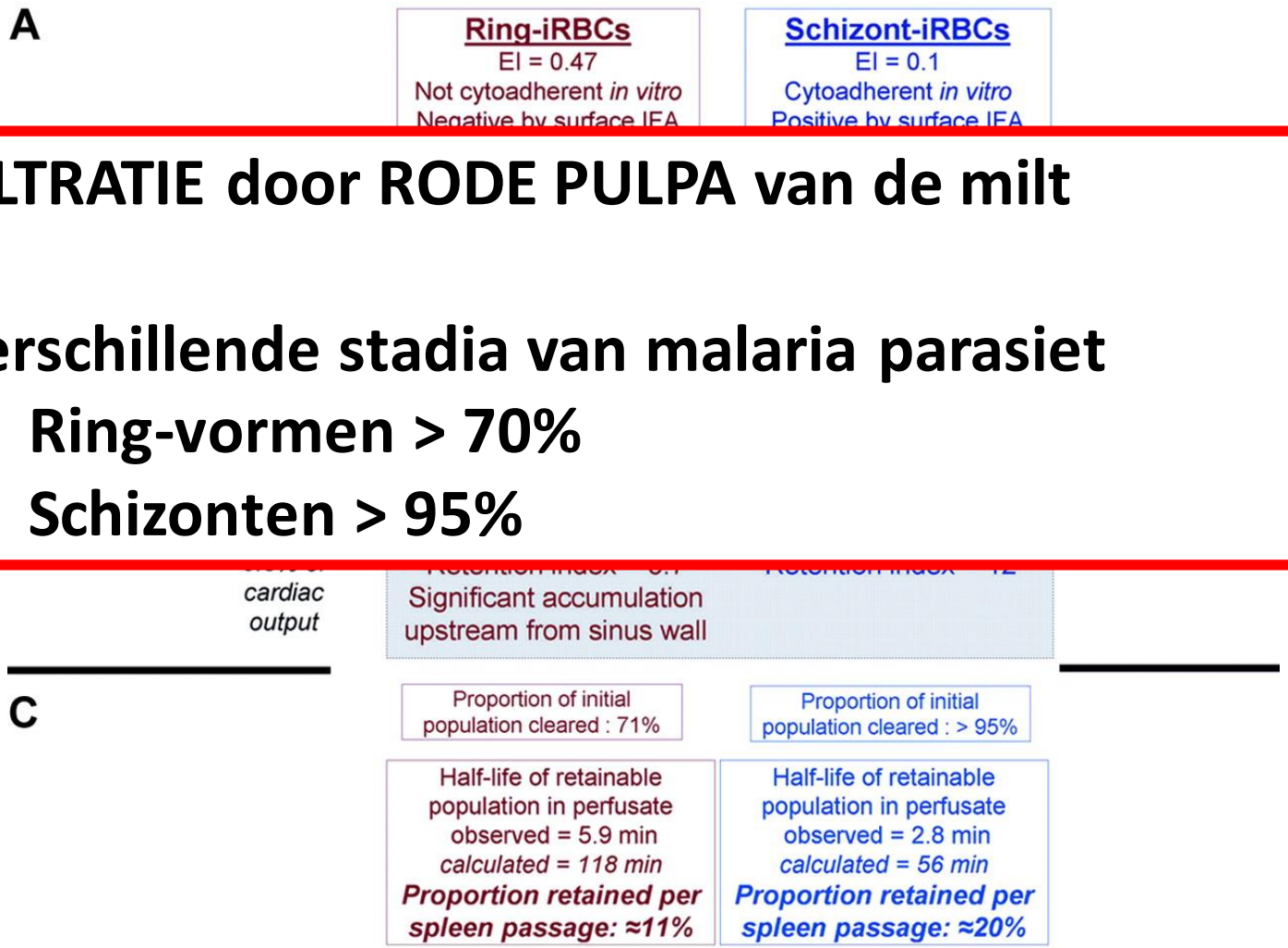

Infected RBC
Pitting in the spleen
Once-infected RBC
C1
sl
5 µm
Parasite DNA
RESA protein (from P. falciparum)

P falciparum–infected RBCs through the fast and slow circulatory compartments of the perfused human spleen



Innocent Safeukui et al. Blood 2008;112:2520-2528

P falciparum–infected RBCs through the fast and slow circulatory compartments of the perfused human spleen



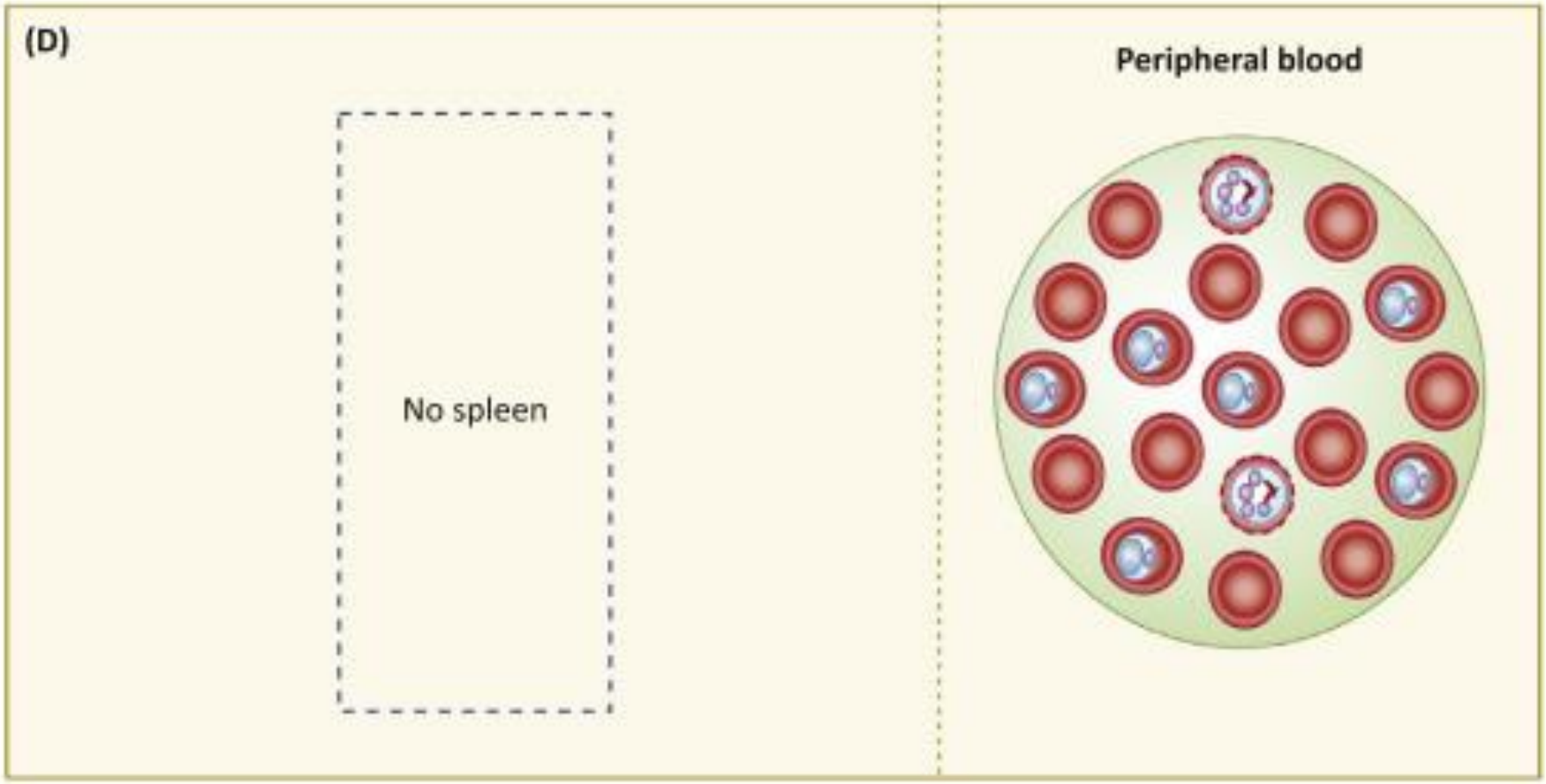
FILTRATIE door RODE PULPA van de milt

Verschillende stadia van malaria parasiet

- **Ring-vormen > 70%**
- **Schizonten > 95%**

Innocent Safeukui et al. Blood 2008;112:2520-2528

Malaria en miltverwijdering



CONCLUSIE

Rode pulpa van milt zorgt voor continue surveillance van rode bloedcellen middels:

I. Mechanische **filtratie** van rode bloedcellen op vorm-afwijkingen en vervormbaarheid
II. Het verwijderen van geïnfecteerde rode bloedcellen en intra-erythrocytaire insluitsels (**pitting**)