

SEROLOGIES MULTIPLEXEES POUR LE DIAGNOSTIC DES MALADIES INFECTIEUSES

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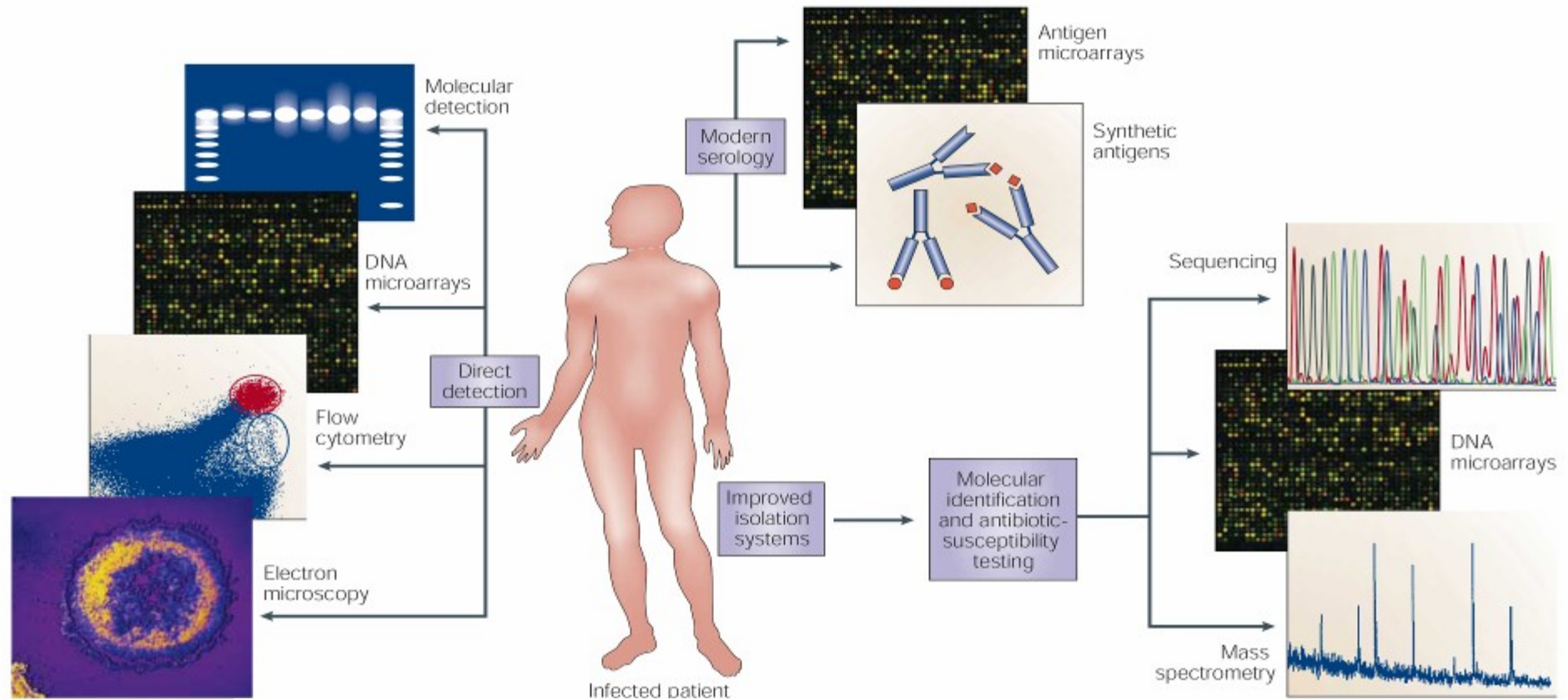


Conflit d'Intêret

Michel Drancourt est actionnaire co-fondateur de la Société InoDiaG dans le cadre de la loi sur l'innovation (article 25-2 de la loi du 15/7/1982 modifiée).



Diagnostic des Maladies Infectieuses



Nature Rev Microbiol. 2004;2:151-9.

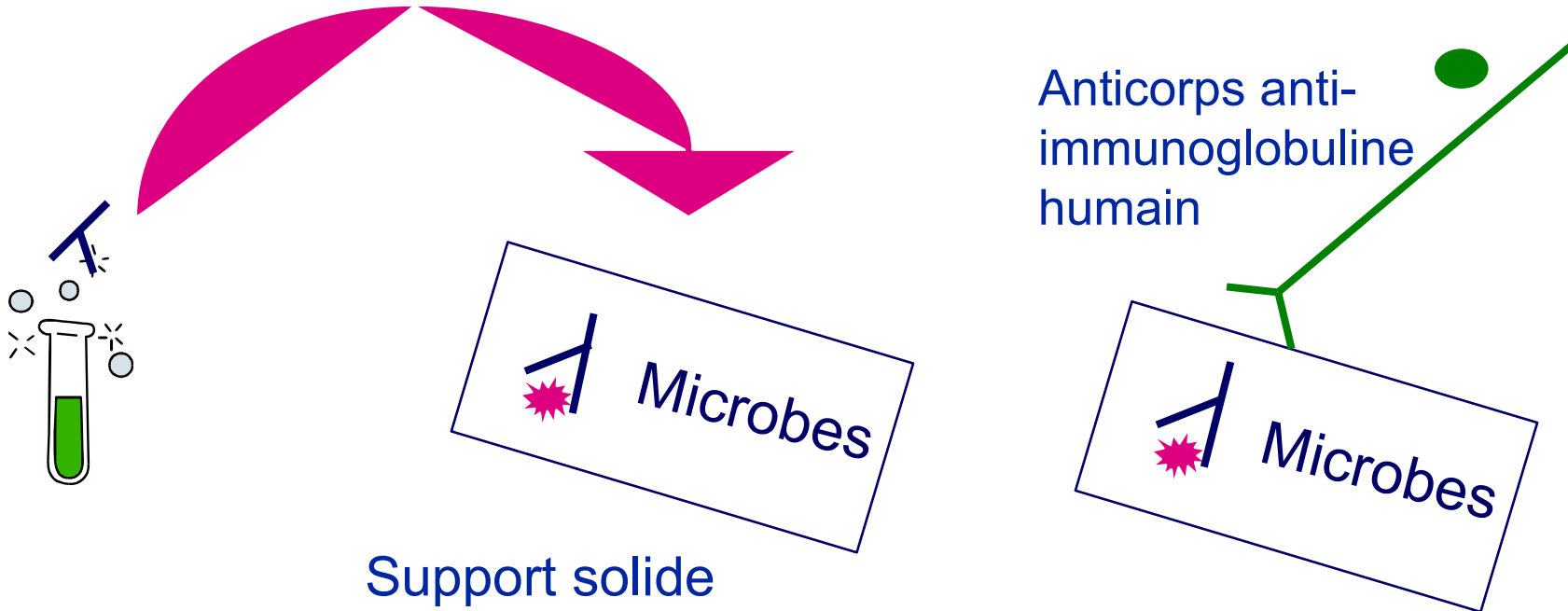


Diagnostic sérologique des maladies infectieuses : données actuelles

- **Diagnostic indirect par détection des anticorps dirigés spécifiquement contre les pathogènes dans le sérum du patient**
- **Techniques :**
 - **E.L.I.S.A.**
 - **Immunofluorescence indirecte : I.F.I**
 - **Western-blot**



Diagnostic sérologique : techniques actuelles



1

Prélèvement de
sérum

2

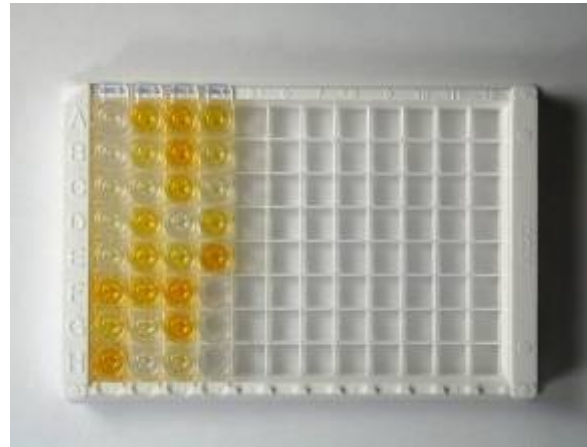
Réaction sérum-
microbe

3

Révélation de la réaction
microbe-sérum



Diagnostic sérologique par ELISA

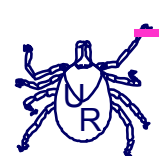


Avantages

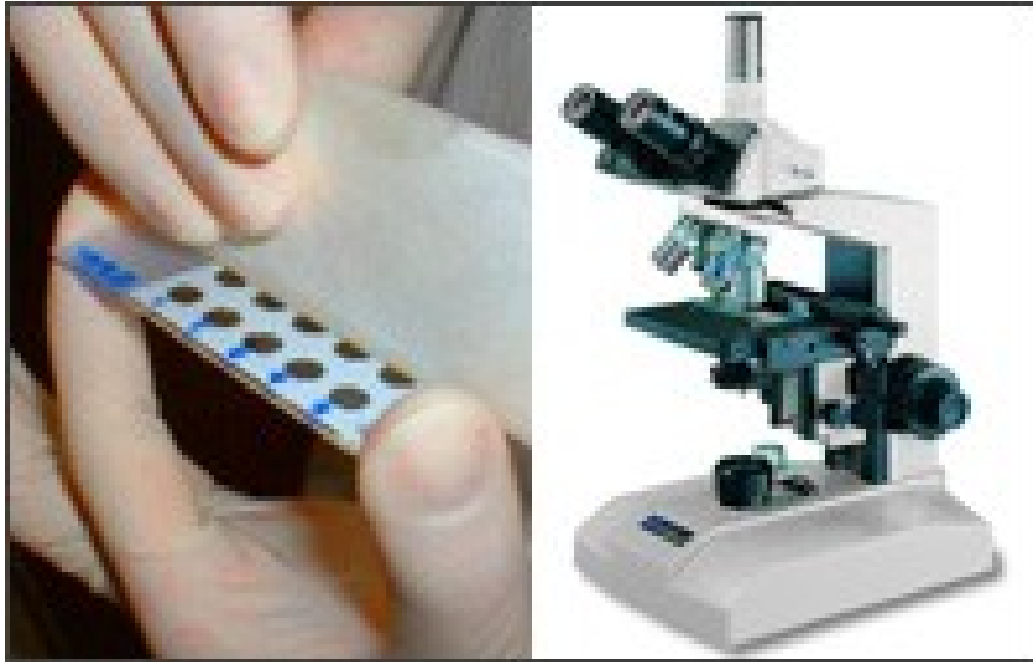
- 96 échantillons
- Automatisé
- Connecté

Limites

- Pas de linéarité du signal
- Un seul microbe testé



Diagnostic sérologique par IFI



Avantages

- Visualisation du pathogène
- Sensibilité
- Linéarité du signal
- IgG, IgM, IgA

Limites

- Manuelle : longue
- Non contrôlé
- 20 μ l de sérum
- Un seul microbe testé



Multiplexage sérologique : billes fluorescentes

Avantages

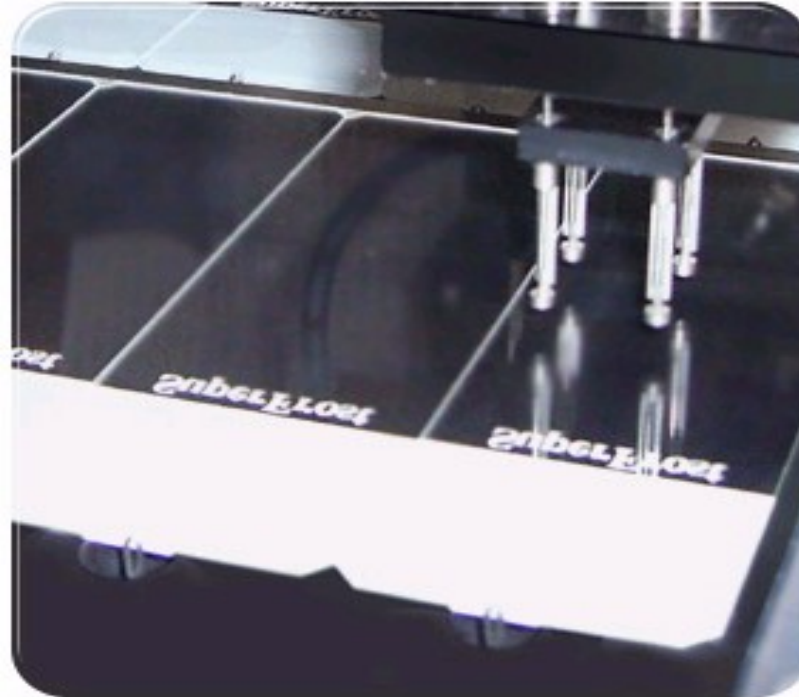
- Multiplexage
- Utilisation facile

Limites

- Instrumentation sophistiquée donc fragile
- Multiplexage limité < 10 antigènes
- Echange d'antigène entre billes



Multiplexage et automatisation sur lames



Multiplexage et automatisation



Multiplexage sérologique : par immunofluorescence sur lame

Avantages

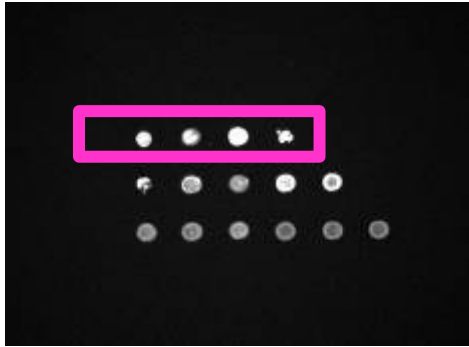
- Robuste
- Multiplexage jusqu'à 36 antigènes

Limites

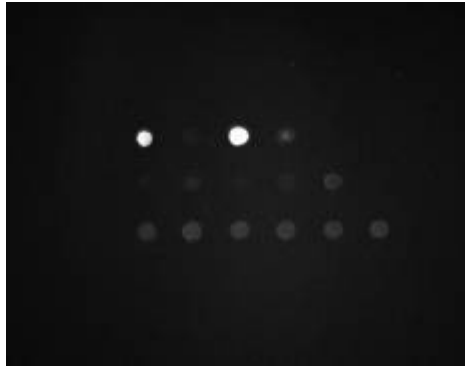
- Lame de verre



Negative serum



Antigen 365 nm

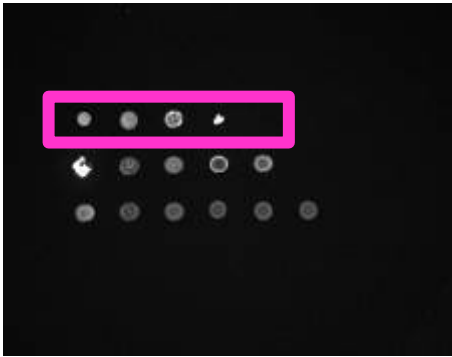


IgG 470 nm

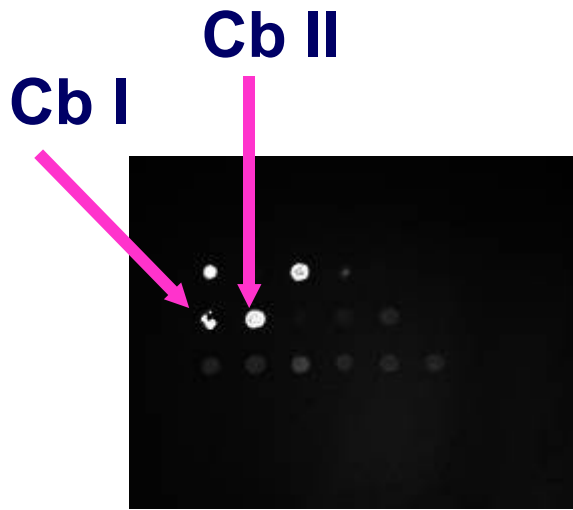


IgM 594 nm

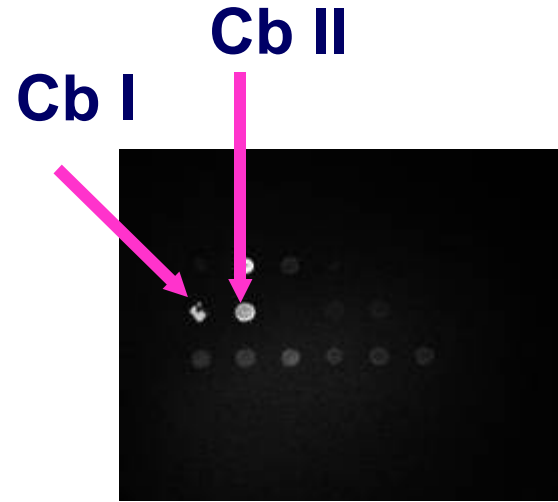
Acute Q fever



Antigen 365 nm



IgG 470 nm



IgM 594 nm



Sérologie multiplexée

- Tester par exposition
 - pneumopathie
 - piquûre de tiques
- Tester par syndrome
- Tester systématiquement

[Samson L. et al. Corpuscular antigenic microarray for the serodiagnosis of blood culture-negative endocarditis. Ann N Y Acad Sci. 2006;1078:595-6 ; Gouriet F. et al. Multiplexed serology in atypical bacterial pneumonia. Ann N Y Acad Sci. 2006;1078:530-40.]



Actuellement commercialisé

Monothématique

- **Syphilis**
- **Coxiella burnetii**
- **EBV**

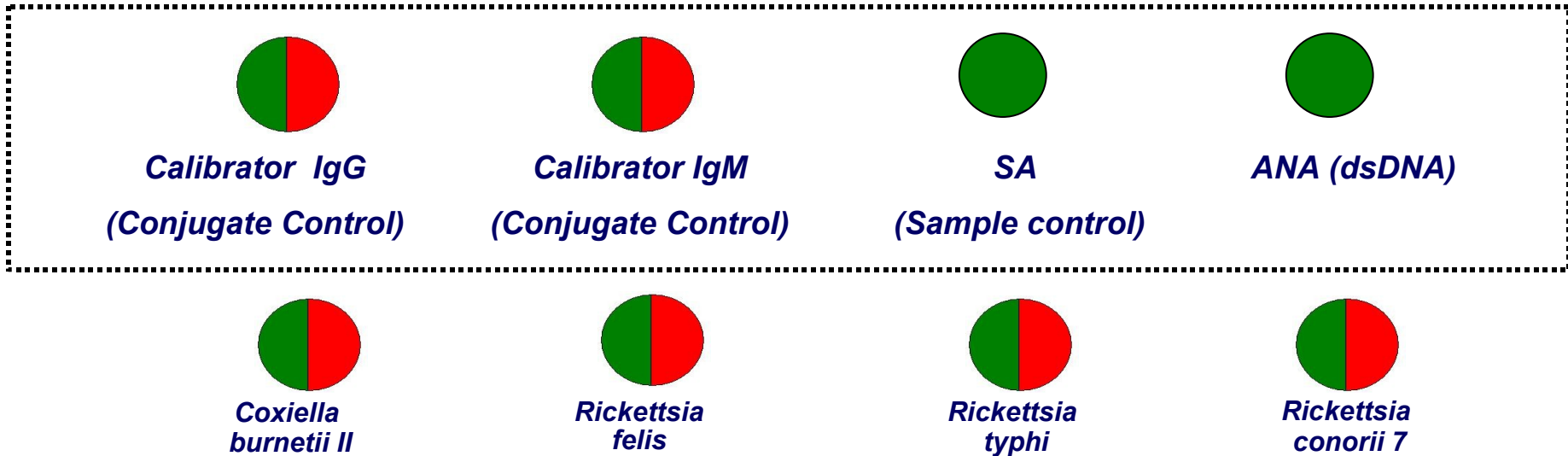
Plurithématique

- **Rickettsies**
- **Chlamydia**
- **Microbiologie standard**
- **Sérologie bactérienne**
- **Pneumonie**
- **Echange d'antigène entre billes**
- **Fièvre au retour des tropiques**
- **S.D.F.**
- **Pathogènes d'amibes**



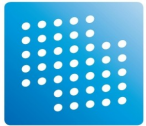
Lame Mu.S.T.® Rickettsi

IgG and IgM





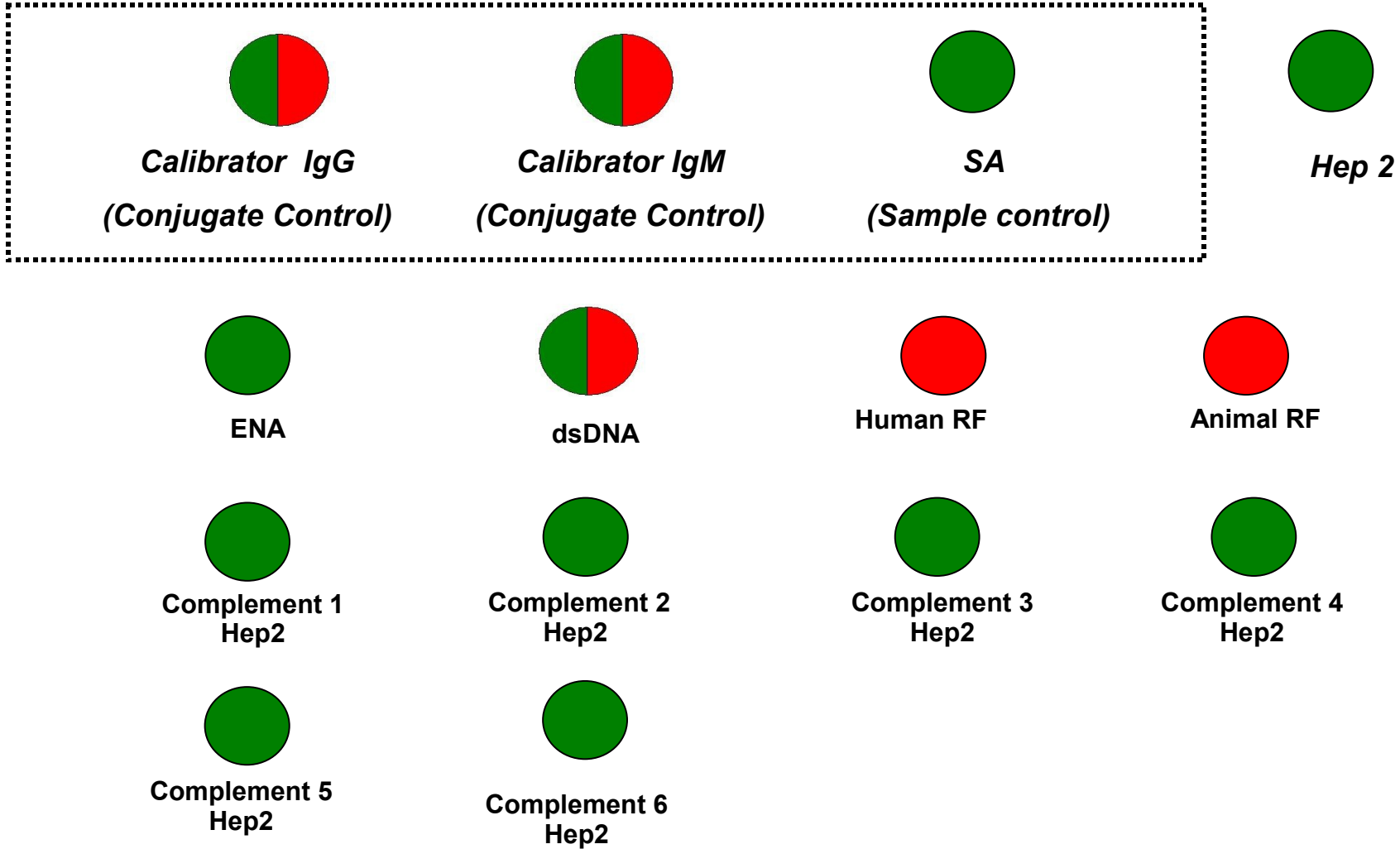
**8^{ème} Journées Nationales d'Infectiologie –
DIJON – 13 JUIN 2007**



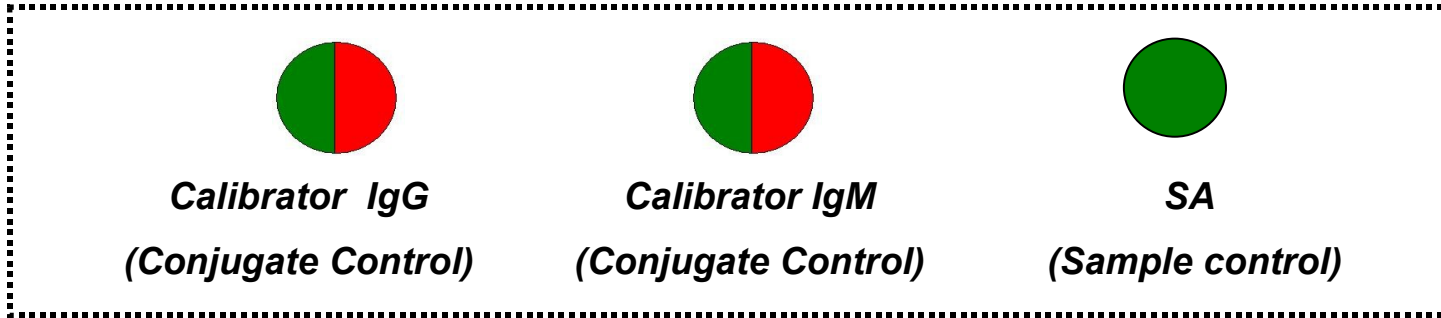
inoDiag®

Lame Mu.S.T.® ANA Screen

IgG



IgG



SSA 52 Kd

SSA 60 Kd (ro)

SSB (La)

Sm

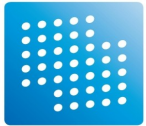
RNP 68 + A + C

Scl70

Centromere

JO1

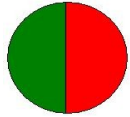




inoDiag®

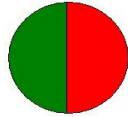
Lame Mu.S.T[®] Thyroid

IgG



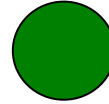
Calibrator IgG

(Conjugate Control)



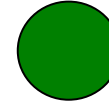
Calibrator IgM

(Conjugate Control)

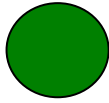


SA

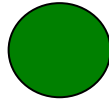
(Sample control)



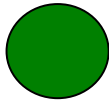
ANA (dsDNA)



TG



TPO

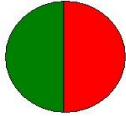


Insulin

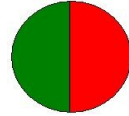


Lame Mu.S.T[®] Syphilis

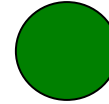
IgG and IgM



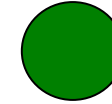
Calibrator IgG
(Conjugate Control)



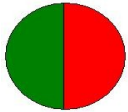
Calibrator IgM
(Conjugate Control)



SA
(Sample control)



ANA (dsDNA)

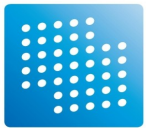


Cardiolipide



Treponema pallidum P17

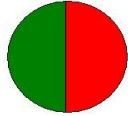




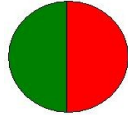
inoDiag®

Lame Mu.S.T[®] Rickettsi

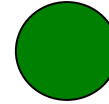
IgG and IgM



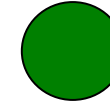
Calibrator IgG
(Conjugate Control)



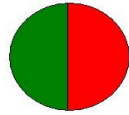
Calibrator IgM
(Conjugate Control)



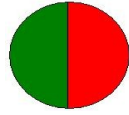
SA
(Sample control)



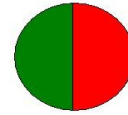
ANA (dsDNA)



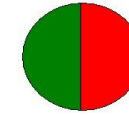
**Coxiella
burnetii II**



**Rickettsia
felis**

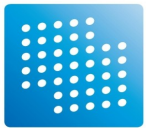


**Rickettsia
typhi**



**Rickettsia
conorii 7**

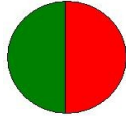




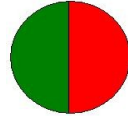
inoDiag®

Lame Mu.S.T.® *Coxiella burnetii*

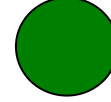
IgG and IgA



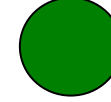
Calibrator IgG
(Conjugate Control)



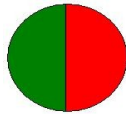
Calibrator IgM
(Conjugate Control)



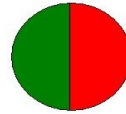
SA
(Sample control)



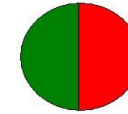
ANA (dsDNA)



Calibrator IgA
(Conjugate Control)



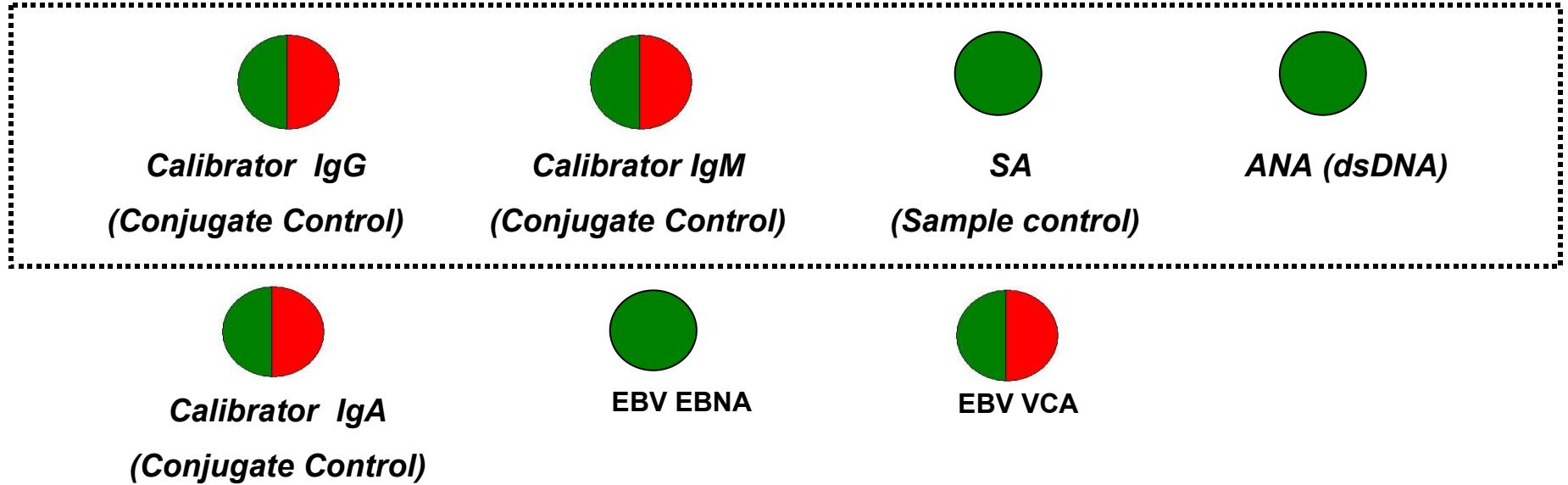
**Coxiella
burnetii I**

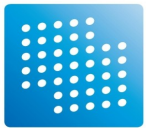


**Coxiella
burnetii II**



IgG and IgM

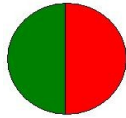




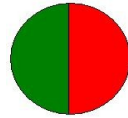
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Lame Mu.S.T.® Chlamydiae

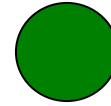
IgG and IgA or IgM



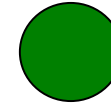
Calibrator IgG
(Conjugate Control)



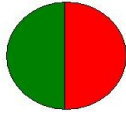
Calibrator IgM
(Conjugate Control)



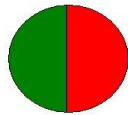
SA
(Sample control)



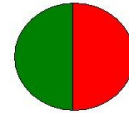
ANA (dsDNA)



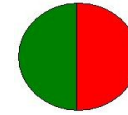
Calibrator IgA
(Conjugate Control)



Chlamydia pneumoniae

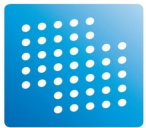


Chlamydia trachomatis



Chlamydia psittaci

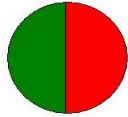




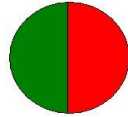
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Lame Mu.S.T® Pneumopathie

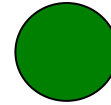
IgG and IgM



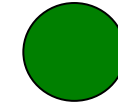
Calibrator IgG
(Conjugate Control)



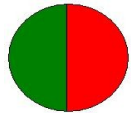
Calibrator IgM
(Conjugate Control)



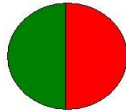
SA
(Sample control)



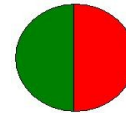
ANA (dsDNA)



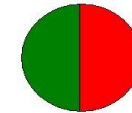
Legionella pneumophila
serogroupe I



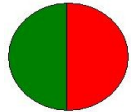
Legionella pneumophila
serogroupe II



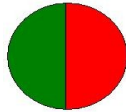
Coxiella burnetii II



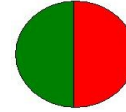
Chlamydia pneumoniae



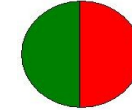
Legionella pneumophila
serogroupe III



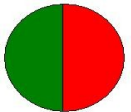
Legionella pneumophila
serogroupe IV



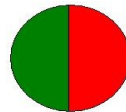
Francisella tularensis



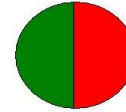
Chlamydia psittaci



Legionella pneumophila
serogroupe V



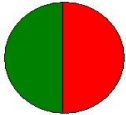
Legionella pneumophila
serogroupe VI

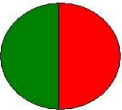


Mycoplasma pneumoniae



IgG and IgM

			
Calibrator IgG (Conjugate Control)	Calibrator IgM (Conjugate Control)	SA (Sample control)	ANA (dsDNA)


Coxiella burnetii II


Rickettsi conorii


Rickettsi typhi


Rickettsi felis


Francisella tularensis


Bartonella henselae Marseille


Bartonella quintana





inoDiag®

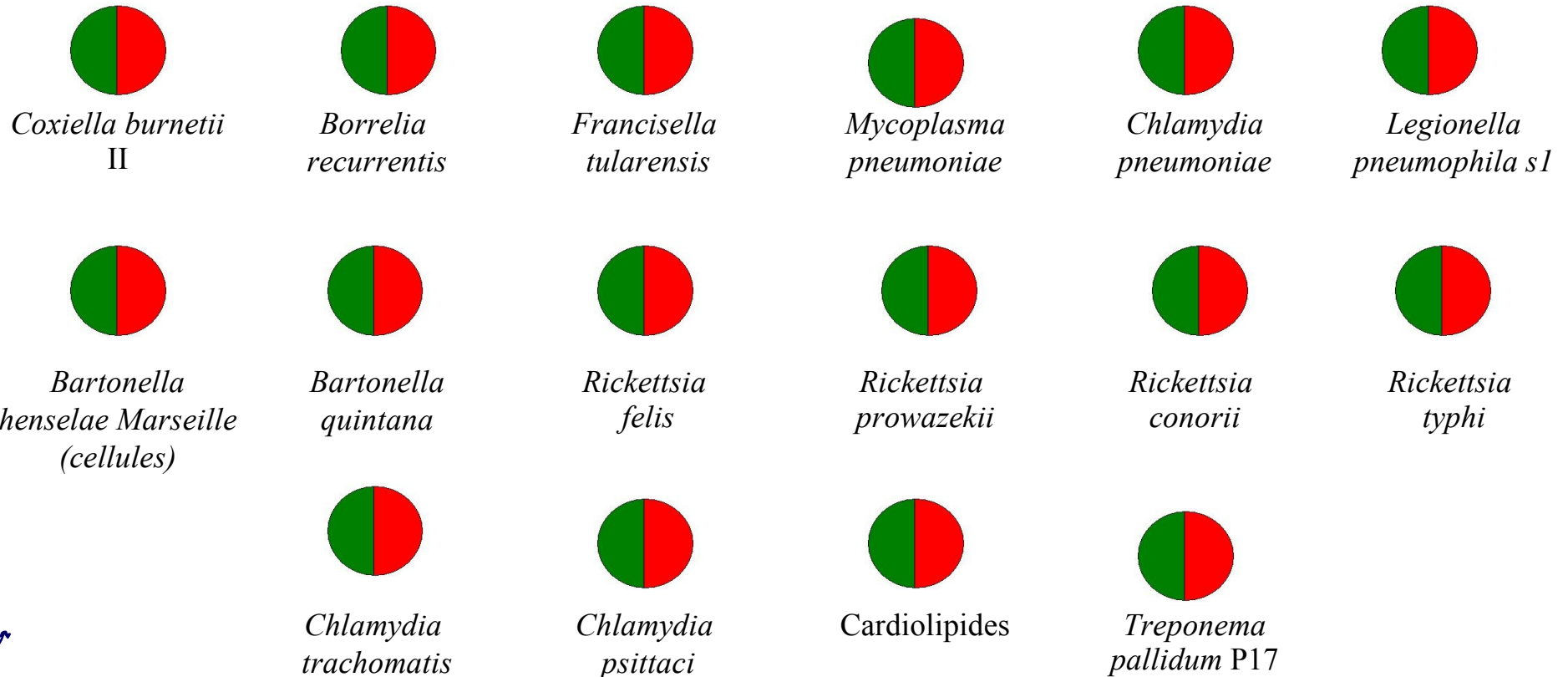
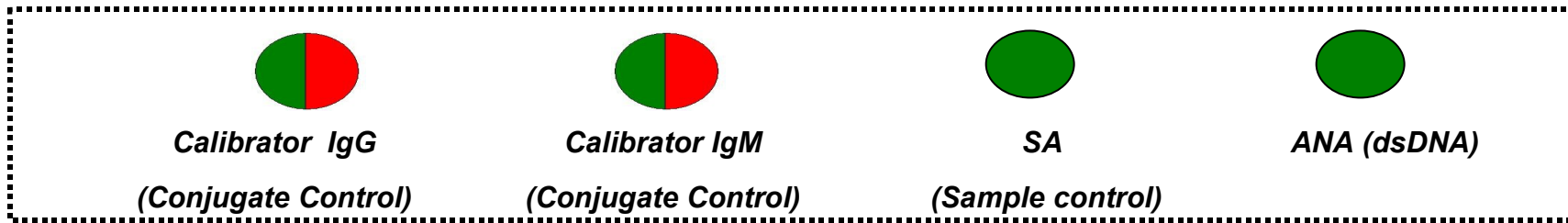
Lame Mu.S.T® SeroBact

IgG and IgM



<i>Helicobacter pylori</i>	<i>Chlamydia psittaci</i>	<i>Mycoplasma pneumoniae</i>	<i>Chlamydia pneumoniae</i>	<i>Chlamydia trachomatis</i>	<i>Brucella melitensis</i>
<i>Legionella pneumophila serogroupe I</i>	<i>Legionella pneumophila serogroupe II</i>	<i>Legionella pneumophila serogroupe III</i>	<i>Legionella pneumophila serogroupe IV</i>	<i>Legionella pneumophila serogroupe V</i>	<i>Legionella pneumophila serogroupe VI</i>
<i>Salmonella typhi</i>	<i>Yersinia pseudotuberculosis</i>	<i>Yersinia enterocolitica O3</i>	<i>Yersinia enterocolitica O9</i>	ASLO	
Cardiolipide	<i>Treponema pallidum p17</i>	<i>Legionella anisa</i>	<i>Legionella longbeachae</i>	<i>Legionella micdadei</i>	<i>Legionella bozemanii</i>
	<i>Borrelia burgdorferi</i>	<i>Leptospira patoc</i>	<i>Leptospira icterohemorragique</i>	<i>Bosea vestrisii</i>	<i>Campylobacter jejunii</i>



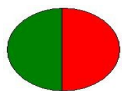




Lame Mu.S.T[®] Amibes

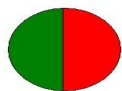
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Calibrator IgG

(Conjugate Control)



Calibrator IgM

(Conjugate Control)



SA

(Sample control)



ANA (dsDNA)



Mycoplasma pneumoniae



Chlamydia pneumoniae



Chlamydia psittaci



Coxiella burnetii II



Parachlamydia (BN9)



Parachlamydia (Hall's coccus)



Balneatrix alpica



Mimivirus



Nordella oligomobilis



Azorhizobium caulinodans



Bradyrhizobium japonicum



Bradyrhizobium liaoningense



Mesorhizobium amorphae



Rasbobacterium



Afipia birgiae



Afipia broomeae



Afipia clevelandensis



Afipia felis



Afipia felis genospecies A



Afipia genospecies 1



Afipia genospecies 2



Afipia genospecies 3



Afipia massiliae



Afipia quartiernordensis



Bosea enae



Bosea massiliensis



Bosea thioxydans

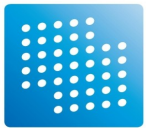


Bosea vestrisii



Afipia saintantoinensis

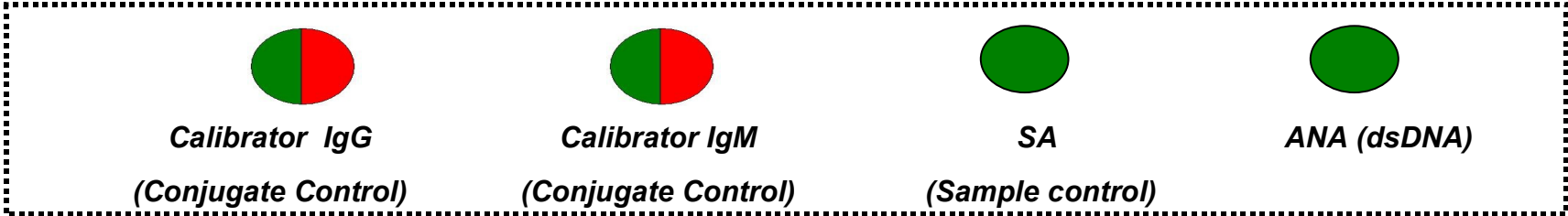






























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Lame Mu.S.T® Tropics

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 <i>Legionella pneumophila</i> serogroupe I	 <i>Legionella pneumophila</i> serogroupe II	 <i>Legionella pneumophila</i> serogroupe III	 <i>Legionella pneumophila</i> serogroupe IV	 <i>Legionella pneumophila</i> serogroupe V	 <i>Legionella pneumophila</i> serogroupe VI
 <i>Coxiella burnetii</i> II	 <i>Mycoplasma pneumoniae</i>	 <i>Chlamydia pneumoniae</i>	 <i>Francisella tularensis</i>	 <i>Bartonella quintana</i>	 <i>Bartonella henselae</i>
 Cardiolipide	 <i>Treponema palidum</i> P 17	 <i>Brucella melitensis</i>	 <i>Rickettsia typhi</i>	 <i>Rickettsia africae</i>	 <i>Rickettsia felis</i>
 <i>Borrelia dutoni</i>	 <i>Leptospira patoc</i>	 Dengue	 <i>Rickettsia prowazekii</i>	 <i>Rickettsia conorii</i>	 <i>Borrelia recurrentis</i>
 <i>Leptospira icterohemoragique</i>		 <i>O. tsutsugamushi</i>			

