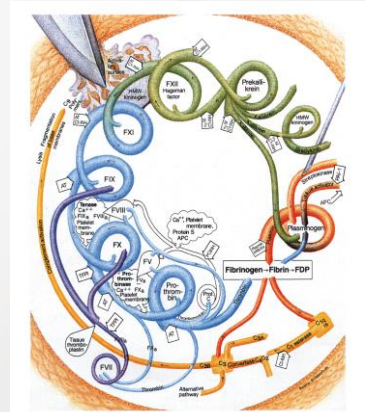


# Haemochrom Diagnostica

Competence in Haemostasis Diagnostics and Endotoxin Analytics

## BMA Workshop Lupus Anticoagulants and Antiphospholipid Antibodies



Haemochrom  
Diagnostica

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## Lupus Anticoagulants and Antiphospholipid Antibodies

Mechanisms

Phospholipids

Diagnostics





## Lupus AC and Anti PL Antibodies

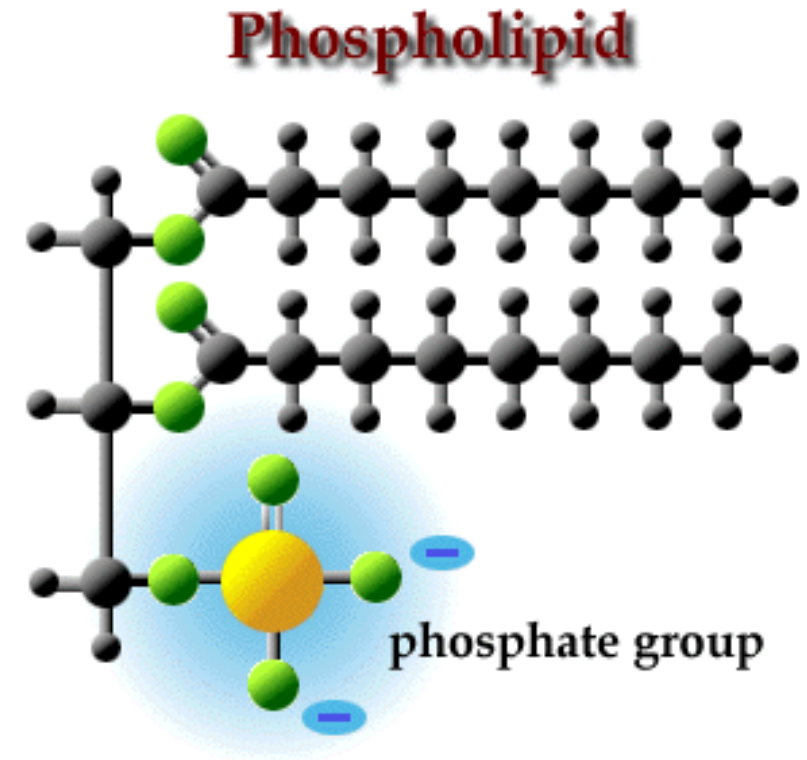
### Historical findings

- » Prolonged clotting times (aPTT) in SLE patients *in vitro*, despite no factor deficiencies
- » No correction in mixing studies
- » In 1972, the unspecific coagulation inhibitor was named Lupus Anticoagulant (LA)
- » Identification of an antibody as an anticoagulatory cause *in vitro*
- » Phospholipids as antigen component

## Lupus AC and Anti PL Antibodies

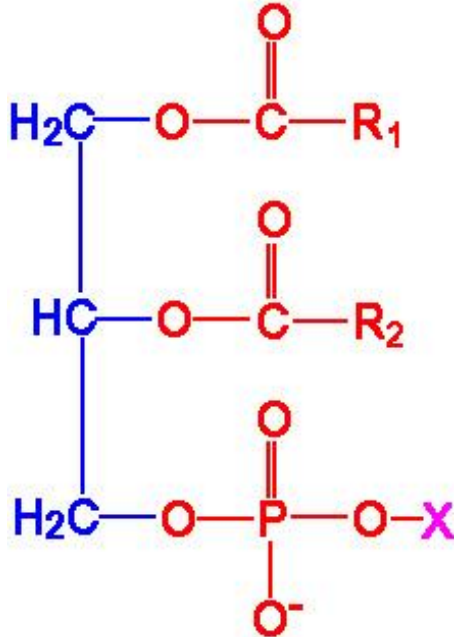
### Phospholipids

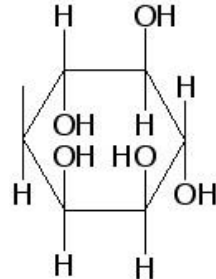
- » Main components of cell membranes (e.g. in platelets)
- » Negatively or neutrally charged molecules
- » Derivatives of fats: One fatty acid is replaced by a phosphate group
- » Fatty acid groups: Hydrophobic
- » Phosphate groups: Hydrophilic



## Lupus AC and Anti PL Antibodies

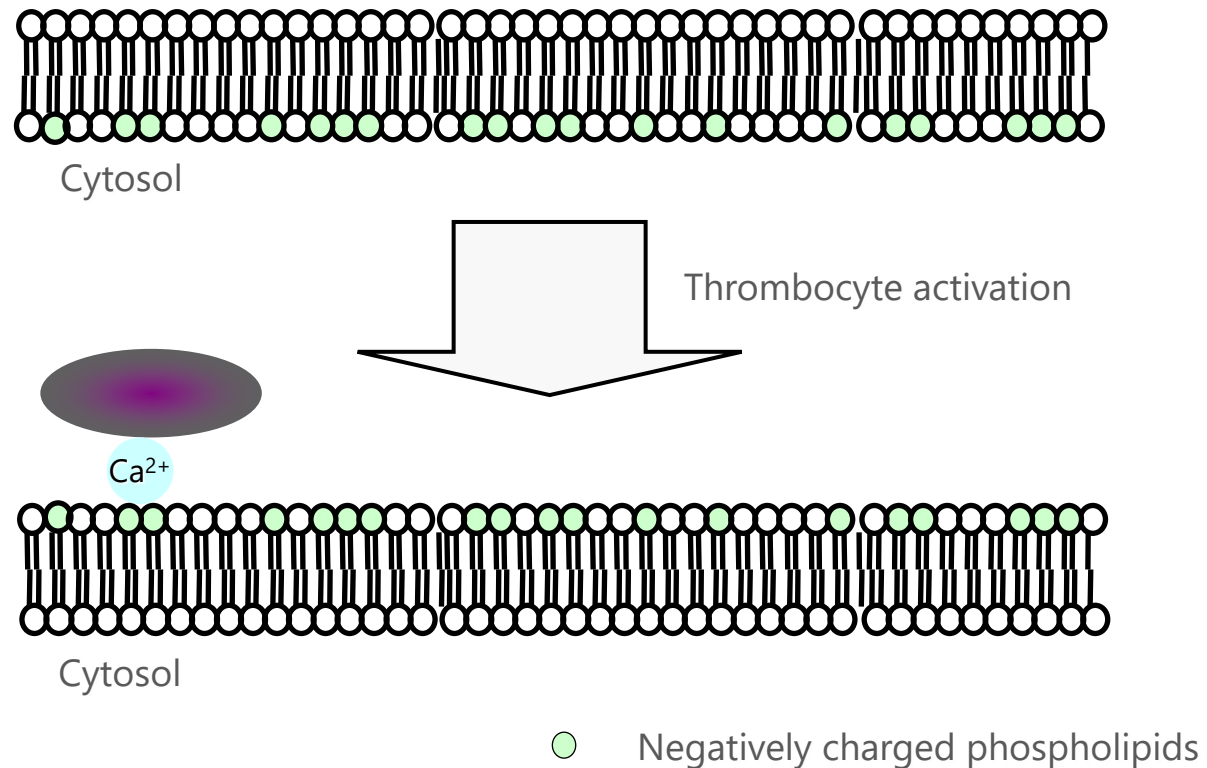
### Phospholipids



X-Struktur	Name	Type
H <sub>2</sub> O	Wasser	Phosphatidic Acid
—CH <sub>2</sub> —CH <sub>2</sub> —NH <sub>3</sub> <sup>+</sup>	Ethanolamine	Phosphatidyl-ethanolamine
—CH <sub>2</sub> —CH <sub>2</sub> —N <sup>+</sup> (CH <sub>3</sub> ) <sub>3</sub>	Choline	Phosphatidyl-choline
—CH <sub>2</sub> —CH(NH <sub>3</sub> <sup>+</sup> )COO <sup>-</sup>	Serine	Phosphatidyl-serine
	Inositol	Phosphatidyl-inositol

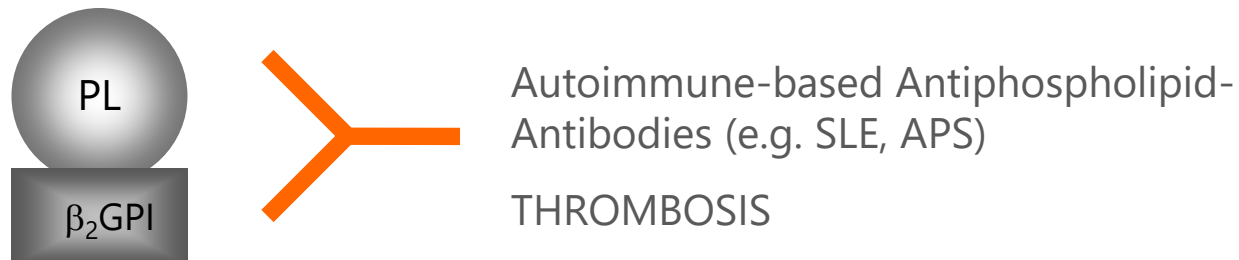
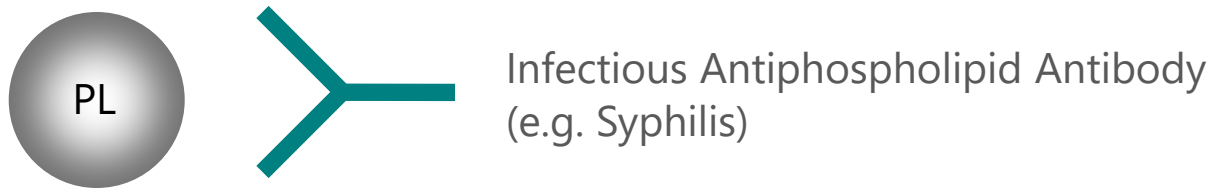
## Lupus AC and Anti PL Antibodies

Flip-Flop-mechanism of phospholipids



## Lupus AC and Anti PL Antibodies

Role of Cofactor in binding antiphospholipid antibodies



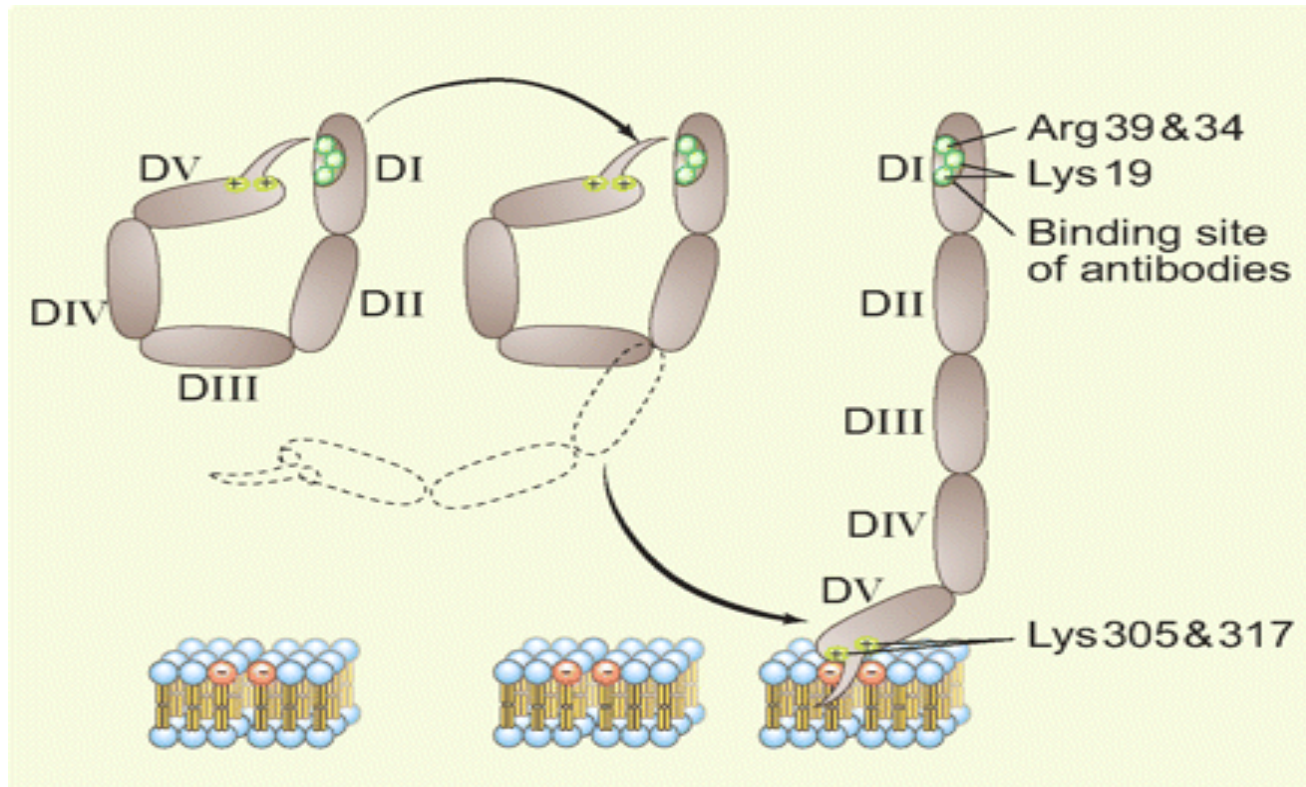
PL = Phospholipid (Cardiolipin, Phosphatidylserine ...)

β<sub>2</sub>GPI = β<sub>2</sub>-Glyoprotein I (Cofactor)



## Lupus AC and Anti PL Antibodies

$\beta_2$ -Glycoprotein 1

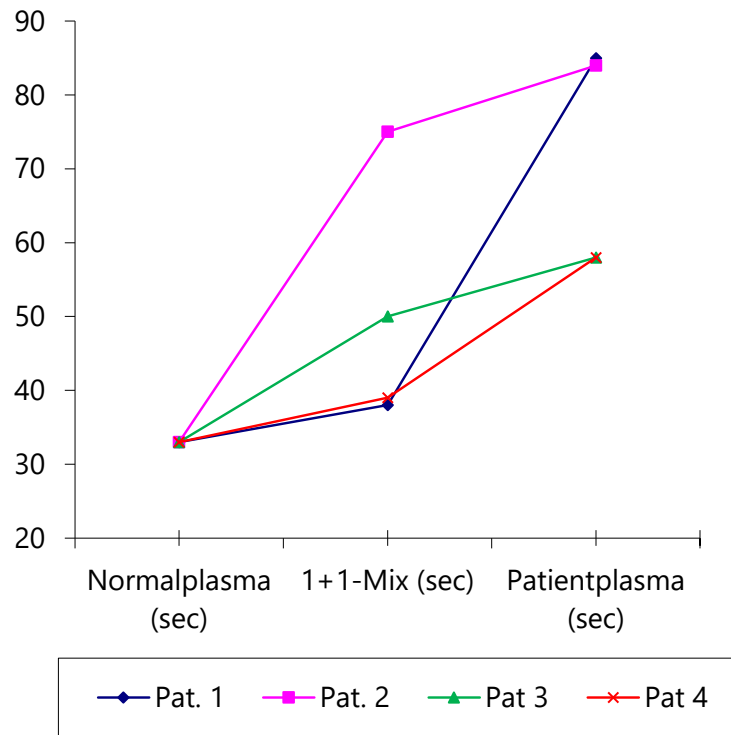


Rand J et al. Blood. 2010; 116(8):1193-1194



## Lupus AC and Anti PL Antibodies

### Plasma Mixing Study



Test no.	NP (sec)	1+1-Mix (sec)	PP (sec)	Resultat
1	33	38	85	Corrected by mixing, no Lupus
2	33	75	84	Not corrected by mixing, LA possible
3	33	50	58	No correction, LA possible
4	33	39	58	Corrected by mixing, no Lupus