

# **10th Postgraduate course in Reproductive Medicine and Reproductive Biology**



**Metalloproteinases as a diagnostic tool of  
Premature Rupture of Membranes?**

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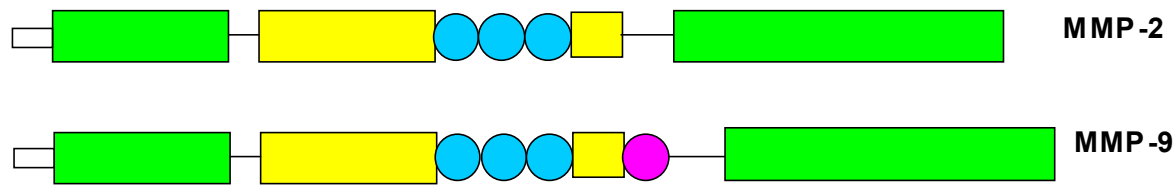
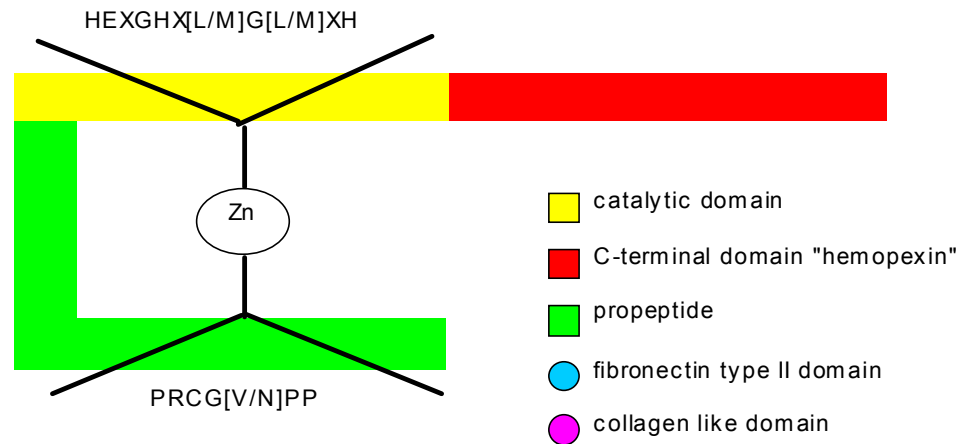
**12, October 2000**



# MMPs and TIMPs

- Definition
- Function and activation
- TIMPs

# Structures of the MMPs





# Classification

- **Gelatinases (MMP-2, MMP-9)**
- **Collagenases (MMP-1, MMP-8, MMP-13, MMP-18)**
- **Stromelysines (MMP-3, MMP-7, MMP-10, MMP-11)**
- **MemType MMPs (MMP-14, MMP-15, MMP-16, MMP-17)**
- **Others (MMP-12, MMP-19)**

# Classification

<b>MMPs</b>	<b>Others names</b>	<b>Substrates</b>	<b>aminoacids</b>	<b>M.W ( Kd)</b>	
				<b>pro-enzyme</b>	<b>active</b>
<b>MMP-1</b>	Intest.collase	Col I,II,III,VII,& X,	469	54	42
	Fibro.collase	entactin			
<b>MMP-2</b>	Gelatinase A	Col I,IV,V,VII,X,&XI	660	72	66
	Intest.collase	fibronectin,elastin			
<b>MMP-3</b>	Stromelysin-1	Col III,IV,IX,X,gelatin	477	57	48
	Transin-1	laminin,fibron,elas,cas			
<b>MMP-7</b>	PUMP -1	casein,fbronectin,gelatin	267	28	19
	Matrilysin				
<b>MMP-8</b>	Neutrop.collase	Col I, III	467	53	65
	PMNL collase				
<b>MMP-9</b>	Gelatinase B	Col IV,V,XIV,gelatin	707	92	88
	92Kd gelatinase				
<b>MMP-10</b>	Stromelysin-2	Col II,IV,V,VII,gelatin,fibron.	476	53	47
	Transin-2				
<b>MMP-11</b>	Stromelysin-3	Col IV,fibronectin,laminine	488	54	
		aggrecan, gelatines			
<b>MMP-13</b>	Collagenase-3	Col I,II,III	471	53	
<b>MMP-14</b>	MT1-MMP	Col I,II,III active pro- MMP-2	582	65	
	MMP-XI	et MMP-13			
<b>MMP-15</b>	MT2-MMP	MMP-2	669	75	
<b>MMP-16</b>	MT3-MMP	active la pro-MMP-2	604	69	
	MMP-X2				



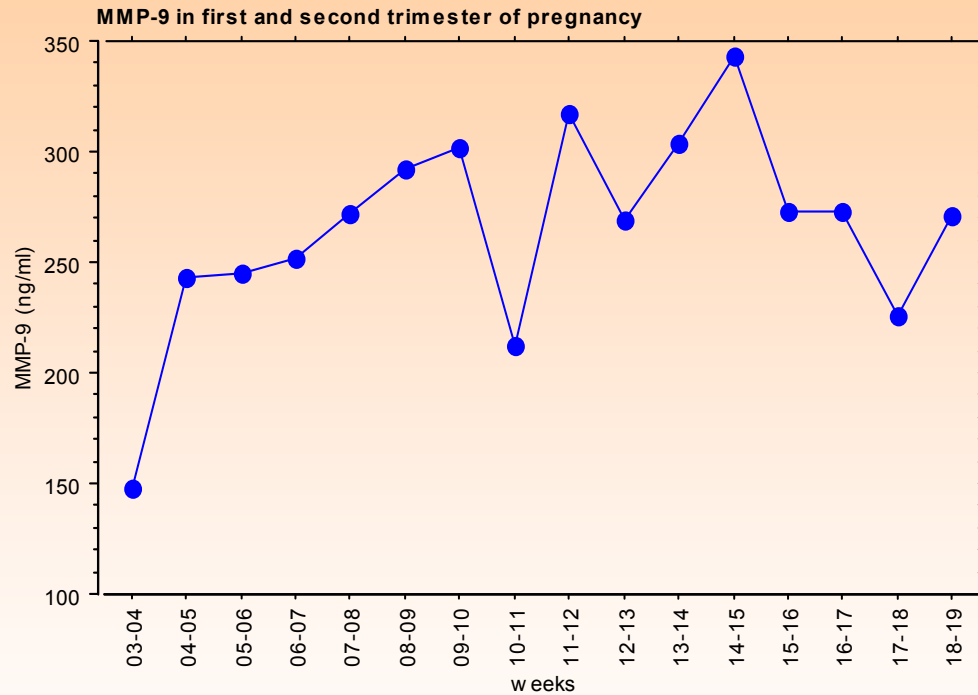
# Clinical relevance

- Cancer
- Pregnancy
- Preeclampsia
- PRM

# MMP-2 is over- expressed in Hydatiforme Mole



# MMP-9 in first and second trimester of pregnancy







# AIMS of the project

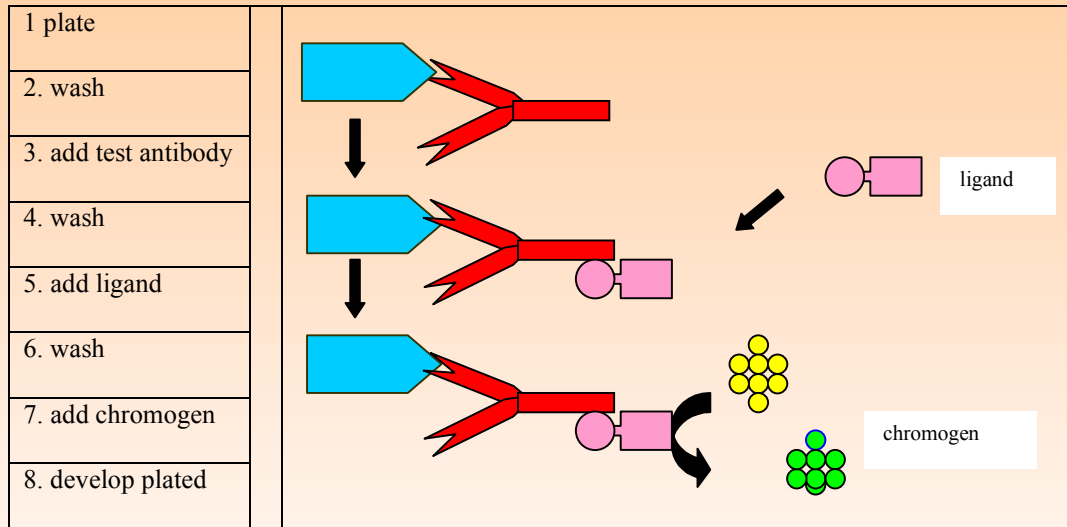
- To see if MMP-2 & MMP-9 can be used as a diagnostic marker for RPM.
- We therefore compared MMPs with the PROM test (IGFBP-1), Bromo and clinical evaluation
- Development of a biochemical test based on MMPs levels as an indicator for RPM



# Materials and methods

- Vaginal secretion of pregnant women
- IGFBP-1, Bromo, clinical evaluation
- ELISA

# The principle of ELISA

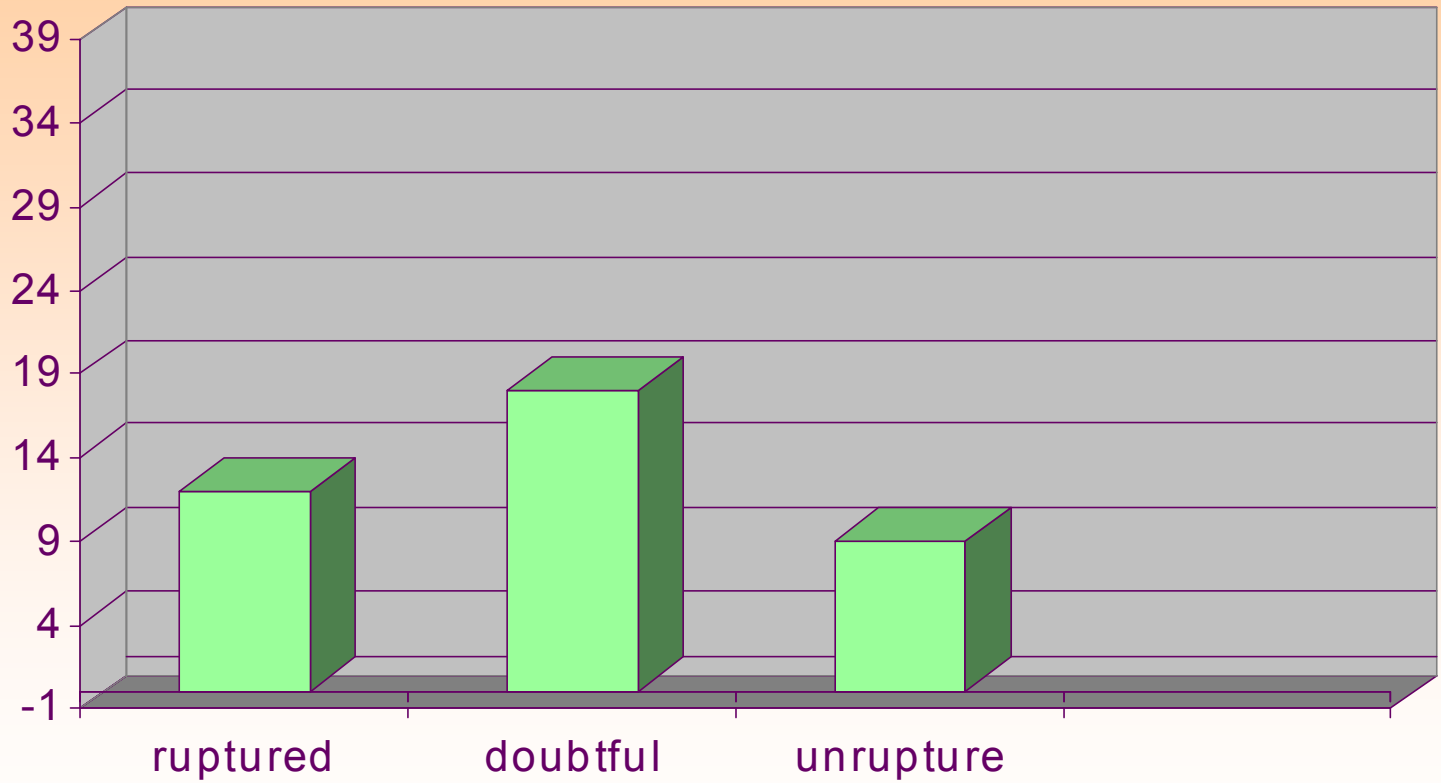




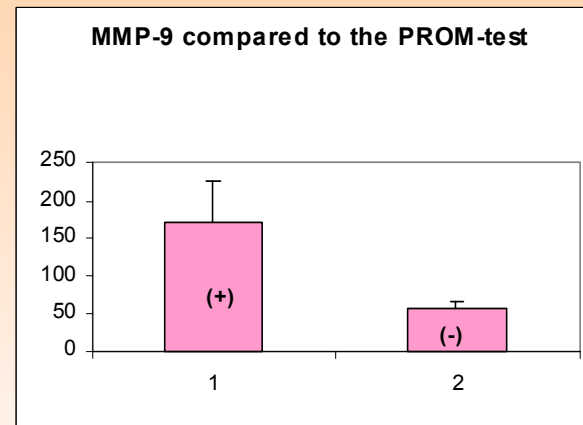
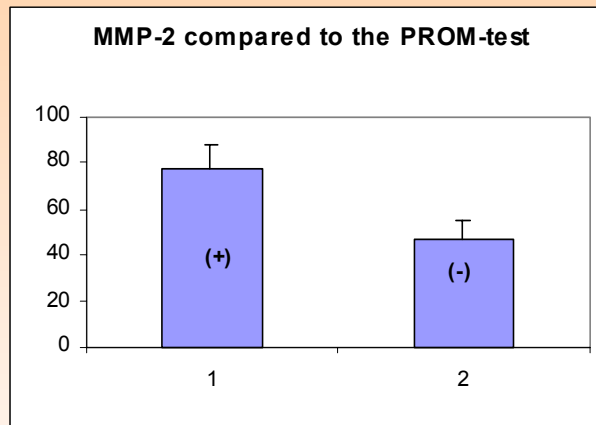
# Patients

- **39 Pregnant women (March - July 2000)**
- **MMP-2 (39) and MMP-9 (29)**
- **Age: 14-41 years old, mean (31,7)**
- **Gestational age: 28- 41 2/7, mean (37 2/7)**

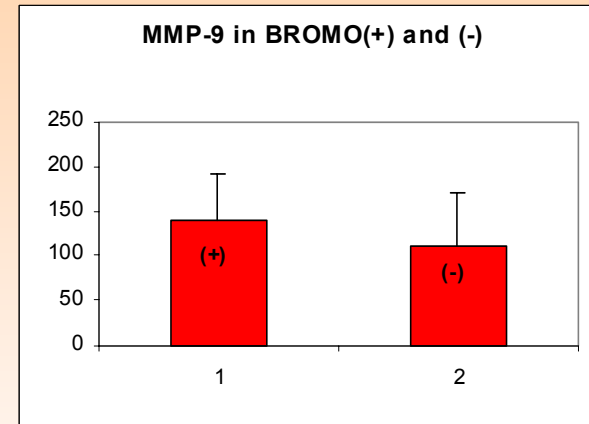
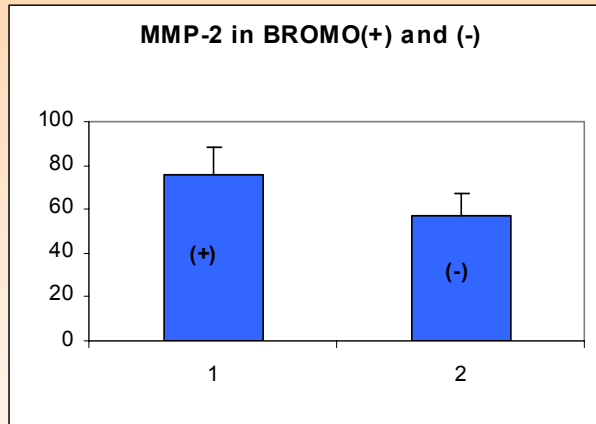
# Ruptured, doubtful, unruptured



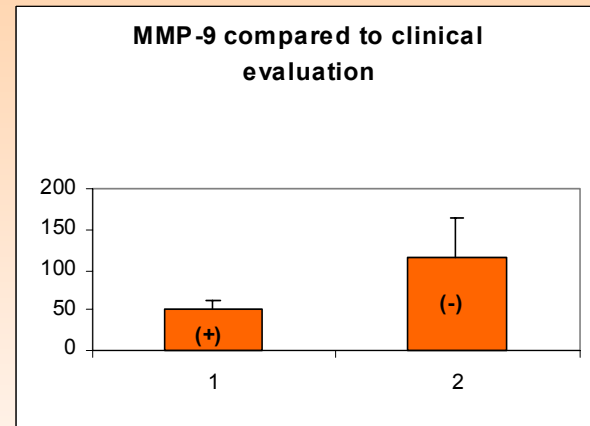
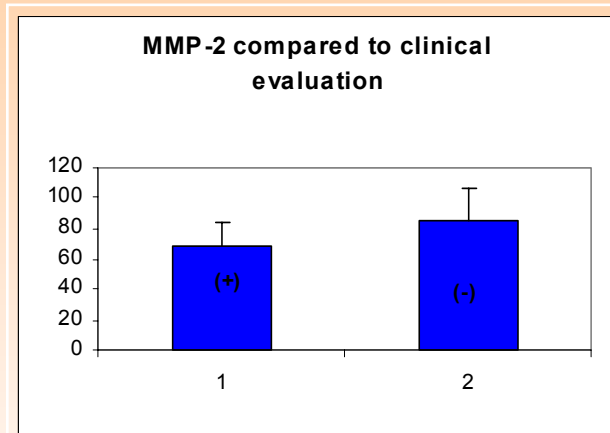
# MMP-2 and MMP-9 compared to the PROM test



# MMP-9 and MMP-2 compared to BROMO



# MMP-2 and MMP-9 compared to clinical evaluation







# Conclusions

- MMP-2 and MMP-9 immunoreactivity correlate well with the results from BROMO and PROM tests but not with the clinical evaluation.
- Further studies can be done to assay the activity of the MMP-2 and MMP-9.

# Zymogramms of MMPs in cytotrophoblastic cells

kDa

212

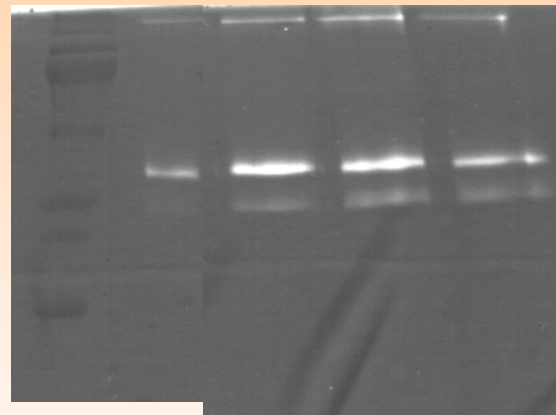
170

116

76

53

53



**MMP-9**

**MMP-2**