

Pentraxin 3

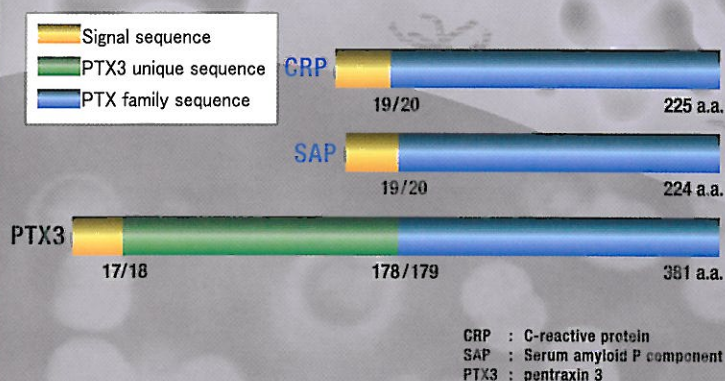


Pentraxin 3 (PTX3) appears to be an excellent predicative biomarker for acute coronary syndrome

Inflammatory mediators are closely involved in atherosclerosis, plaque formation and rupture¹. One of the most famous inflammatory mediators is CRP (C-reactive protein) which has been widely used as an inflammatory biomarker for predicting the occurrence of future cardiovascular events. CRP and SAP (Serum Amyloid P component) are referred to as classical short pentraxins and are acute phase proteins produced from the liver in response to inflammatory mediators²⁻³.

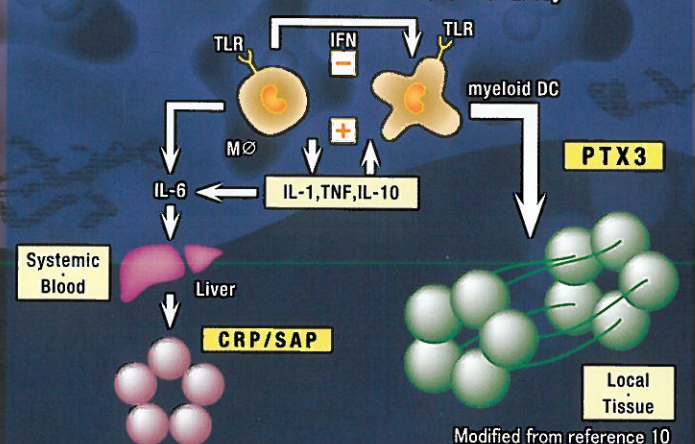
Pentraxin 3 (PTX3), a recently identified member of the pentraxin family, is referred to as a long pentraxin and contains a unique PTX3 domain not found in CRP or SAP. In contrast to CRP, PTX3 is produced from the major cell types involved in atherosclerotic lesions, namely vascular endothelial cells, vascular smooth muscle cells, and macrophages, in response to inflammatory stimuli⁴⁻⁷. Moreover, CRP is produced by the liver and represents a systemic response to inflammation, whereas PTX3 is rapidly produced directly from damaged tissues and directly reflects the inflammatory state of the vasculature. PTX3 levels have been reported to be significantly elevated in acute myocardial infarction⁸, and accordingly, statin treatment significantly decreases PTX3 levels⁹. Due to the fact that PTX3 is able to reflect ACS condition better than CRP, it is highly possible that PTX3 is a superior biomarker to predict future cardiovascular events¹¹.

Amino acid sequence of PTX3 and other Pentraxin family members



Modified from reference 10

Pentraxins in humoral innate immunity



Modified from reference 10

1. Lusis AJ, et al. *Nature*. 2000;407:233-41
 2. Baumann H, et al. *Immunol Today*. 1994;15:74-80
 3. Steel DM, et al. *Immunol Today*. 1994;15:81-88

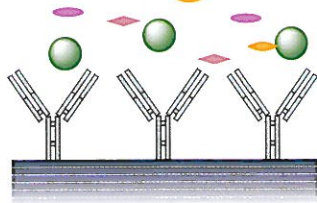
4. Lee GW, et al. *J Immunol*. 1994;153:3700-7
 5. Bottazzi B, et al. *J Biol Chem*. 1997;272:32817-23
 6. Introna M, et al. *Blood*. 1996;87:1862-72

7. Basile A, et al. *J Biol Chem*. 1997;272:8172-8
 8. Peri G, et al. *Circulation*. 2000;102:636-41
 9. Morikawa S, et al. *J Atheroscler Thromb*. 2002;9:178-83

10. Garlanda et al. *Annu. Rev. Immunol.* 2005;23:337-66
 11. Inoue K, et al. *Arterioscler. Thromb. Vasc. Biol.* 2007;27:161-167

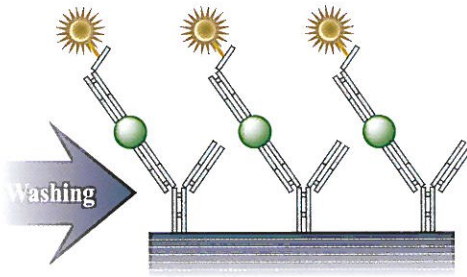
human PTX3 ELISA System ^{*11}

Protocol



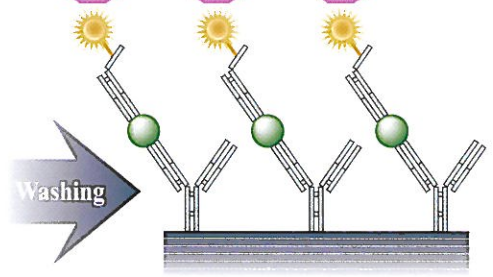
STEP 1

Add 100μL plasma samples in EDTA vacuum containers to each well and incubate 1hour RT



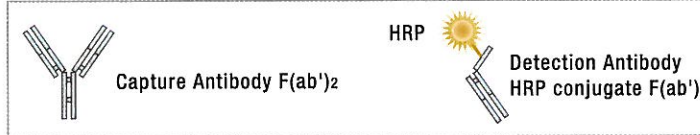
STEP 2

Add 100 μL conjugate to each well
Incubate 1 hour at RT



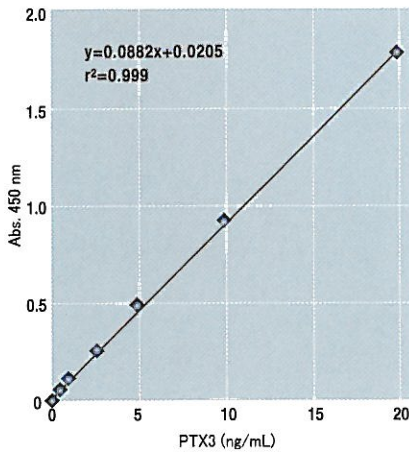
STEP 3

Add 100μL substrate solution and incubate 30min. Add 100μL stop solution and read at 450 nm



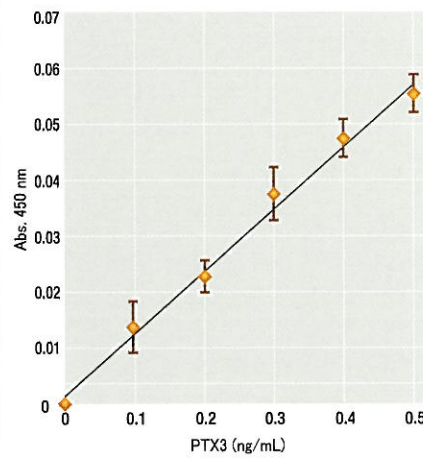
Dynamic range

Representative calibration curve based on PTX3 calibrators of 0.5-20 ng/mL at 450nm



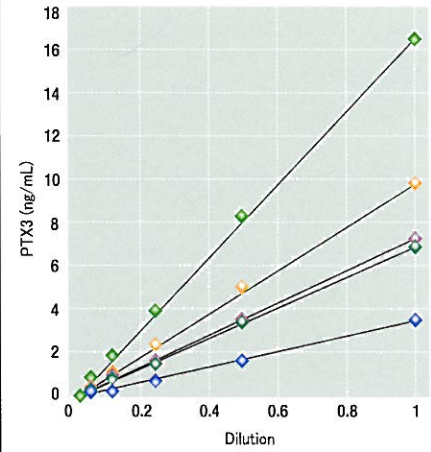
Detection limit

The lower limit of detection is 0.1ng/ml



Linearity

Dilution curves of plasma samples show good linearity



Cross reactivity

Cross reactivity with CRP and SAP is < 0.1ng/mL

PTX3 Standard	NET	CRP			SAP		
		Apply	NET	PTX3 (ng/mL)	Apply	NET	PTX3 (ng/mL)
0ng/mL	0.000	0ng/mL	0.000	<0.1ng/mL	0ng/mL	0.001	<0.1ng/mL
0.5ng/mL	0.057	10ng/mL	0.004	<0.1ng/mL	10ng/mL	0.005	<0.1ng/mL
1.0ng/mL	0.111	20ng/mL	0.003	<0.1ng/mL	20ng/mL	0.003	<0.1ng/mL
2.5ng/mL	0.270	50ng/mL	0.007	<0.1ng/mL	50ng/mL	0.007	<0.1ng/mL
5.0ng/mL	0.522	100ng/mL	0.007	<0.1ng/mL	100ng/mL	0.007	<0.1ng/mL
10ng/mL	1.001	500ng/mL	0.004	<0.1ng/mL	500ng/mL	0.004	<0.1ng/mL
20ng/mL	1.790	1 μg/mL	0.004	<0.1ng/mL	1 μg/mL	0.003	<0.1ng/mL
		5 μg/mL	0.005	<0.1ng/mL	5 μg/mL	0.004	<0.1ng/mL

Reproducibility

Intra assay

Sample No.	Well 1	Well 2	Well 3	Well 4	Well 5	Mean (ng/mL)	SD	CV
1	15.88	16.10	15.98	15.76	15.84	15.91	0.13	0.8%
2	7.22	7.05	7.30	7.14	7.13	7.17	0.10	1.3%
3	9.85	9.91	9.18	9.76	9.79	9.70	0.30	3.0%
4	0.93	0.94	0.94	0.94	0.97	0.95	0.02	1.6%
5	0.81	0.82	0.89	0.83	0.87	0.85	0.03	4.1%
6	0.64	0.66	0.69	0.66	0.68	0.67	0.02	2.9%

Inter assay

Sample No.	Experiments			Mean (ng/mL)	SD	CV
	1st	2nd	3rd			
1	15.41	16.68	15.76	15.95	0.66	4.1%
2	7.04	7.46	7.13	7.21	0.22	3.1%
3	9.54	10.17	9.38	9.70	0.42	4.3%
4	0.94	0.97	0.93	0.95	0.02	2.2%
5	0.84	0.91	0.87	0.87	0.03	4.0%
6	0.66	0.67	0.64	0.66	0.01	1.8%

*11. Inoue K, et al. *Arterioscler. Thromb. Vasc. Biol.* 2007;27:161-167



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