CD Creative Diagnostics®

Procalcitonin (PCT) and Calcitonin (CT) Antibodies for Assay Development

Overview

Procalcitonin (PCT) is a small protein synthesized by the C-cells in thyroid glands. It is considered to be the main marker of disorders associated with systemic inflammation and sepsis. In addition to sepsis and infection, PCT levels can be elevated as a result of surgery, polytrauma, heat shock, burn injuries, or cardiogenic shock. The monitoring of PCT levels after cardiac surgery or heart transplantation helps to differentiate an acute graft rejection from bacterial or fungal infections.

Synthesis of Procalcitonin (PCT) and Calcitonin (CT)

Initially, pre-procalcitonin is synthesized by the C-cells of the thyroid. Pre-procalcitonin mainly comprises an N-terminal of 82 amino acids, active calcitonin (a 32-peptide), and katacalcin (a 21-peptide). Pre-procalcitonin enters the endoplasmic reticulum where it undergoes glycosylation and enzymatic cleavage of the signal peptide to form Procalcitonin (PCT). PCT is then further processed by various proteases, first cleaving the N-terminal peptide to form a 57-peptide (N-ProCT, aa 1-57), and then degraded to produce mature calcitonin and katacalcin (aa 96-116). Mature calcitonin is amidated at the C-terminal to form active calcitonin (aa 60-91).

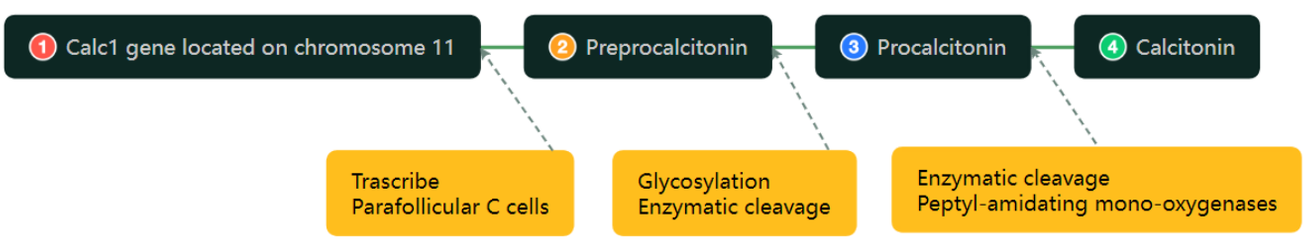

Figure 1. Normal synthesis pathway of PCT and CT

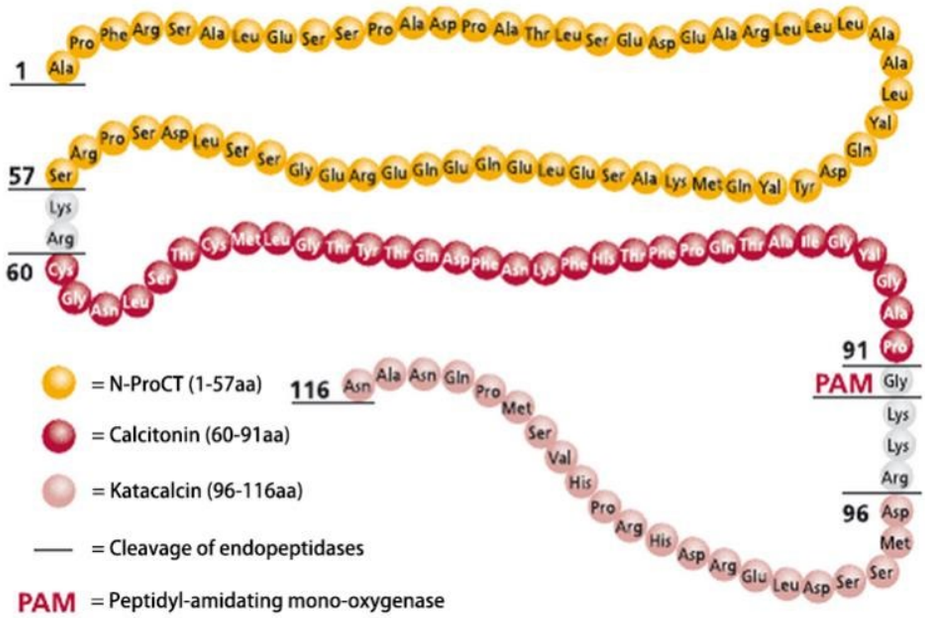

Figure 2. PCT molecule

Clinical Significance of PCT and CT

PCT is a good marker of bacterial infection and the severity of inflammation. It is typically present at low concentrations in the peripheral blood of healthy individuals, often undetectable, but can be produced in various tissues and by multiple cell types during inflammation, especially bacterial infections. Besides, it has been confirmed in multiple studies that monitoring the PCT level changes following cardiac surgery or heart transplantation helps differentiate acute graft rejection from bacterial and fungal infections.

CT plays a role in calcium homeostasis by lowering blood calcium levels. It works with parathyroid hormone (PTH) and vitamin D to regulate calcium and phosphorus metabolism in the body. It does this by inhibiting osteoclast activity and stimulating osteoblast growth, thereby inhibiting bone decalcification and preventing calcium loss, leading to a decrease in blood calcium levels. It also inhibits renal tubular re-absorption of phosphorus, increasing urinary phosphate excretion and consequently lowering blood phosphate levels.

For the development of PCT immunoassays, we offer monoclonal antibodies specific to different fragments of the PCT molecule.

Products Performance

PCT antibody pairs: DMAB1357MH and DMABT-H1296MH

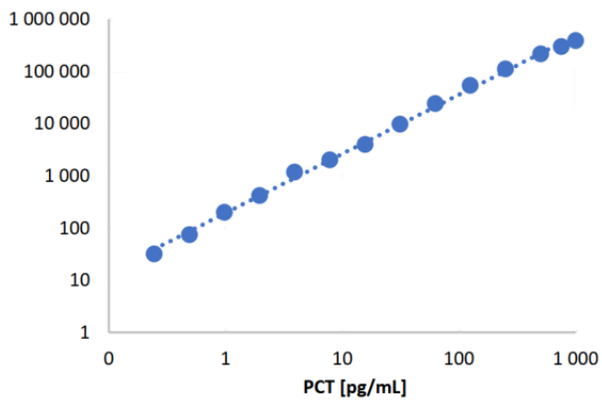

Figure 3. Calibration curves for h-PCT CLIA.

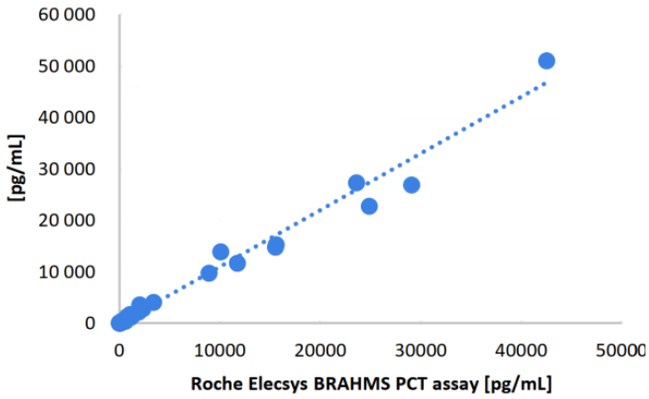

Figure 4. Correlation of the developed assays with the Elecsys® BRAHMS PCT assay.

CT antibody pairs: DCABY-4599 and DCABY-4600

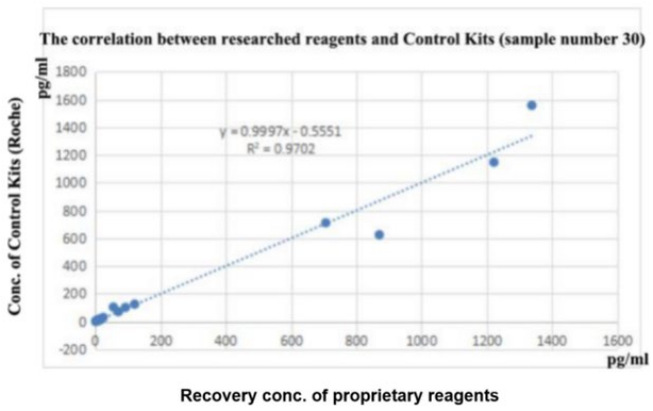

Figure 5. The correlation between proprietary acridine ester CLIA CT testing reagents and control kits

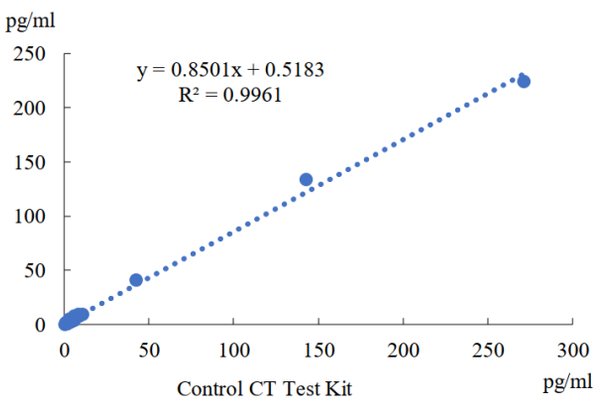

Figure 6. Evaluation of clinical samples (N=38) in an acridine ester CLIA test kit compared to a control kit.

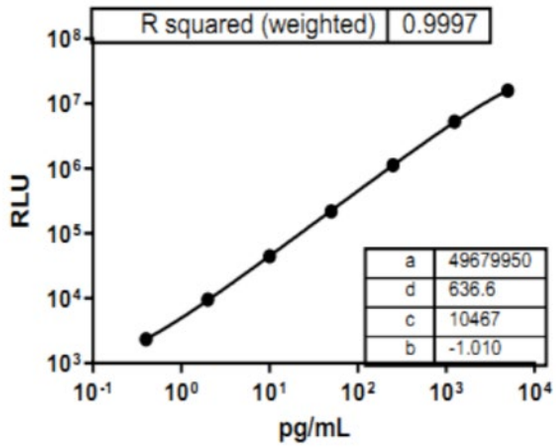

Figure 7. Acridine ester CLIA CT standard curve

Highlighted Products

Creative Diagnostics provides a series of antibody products specific to different fragments of the PCT molecule for immunoassay development. These specificity-measured antibodies can be used for the detection of the full-length or partially processed PCT molecule. In addition to antibodies, we also offer recombinant full-length PCT antigens that can be used as calibrators in PCT or CT immunoassays.

Figure 8. The amino acid sequence of human PCT

PCT Antibodies

Cat.	Product Name	Specificity	Applications
DMAB1357MH	Anti-PCT monoclonal antibody, clone 14C10	**Epitope**: Calcitonin domain (aa 72 - 81) **No cross-reaction** with: Calcitonin, Katacalcin, CGRP1, and CGRP2.	Pair with DMABT-H1296MH Best sensitivity (LFIA/CLIA)
DMABT-H1296MH	Anti-PCT monoclonal antibody, clone 34C23	**Epitope**: N-term PCT (aa 11-25) **No cross-reaction** with: Calcitonin, Katacalcin, CGRP1, and CGRP2.	Pair with DMAB1357MH Bestsensitivity (LFIA/CLIA)
DMAB1352MH	Anti-PCT monoclonal antibody, clone 39G12	**Epitope**: N-term PCT (aa 21-40)	Pair with CABT-L6524Z (ELISA)

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Cat.	Product Name	Specificity	Applications
CABT-L6524Z	Anti-PCT monoclonal antibody, clone 33B22	**Epitope**: Katacalcin domain (aa 96-105)	Pair with DMAB1352MH (ELISA)
DCAB-TJ170	Magic™ Anti-PCT monoclonal antibody, clone 29C8	**Epitope**: Katacalcin domain (aa 102-111)	Pair with CABT-WN1111 (ELISA)
CABT-WN1111	Anti-Calcitonin monoclonal antibody, clone 25B3	**Epitope**: Calcitonin domain (aa 72 - 81)	Pair with DCAB-TJ170 (ELISA)
DMABP-L38	Mouse Anti-PCT monoclonal antibody, clone IN089	**Epitope**: N-term PCT	Pair with DMABP-L39 (ELISA/LFIA) Pair with CABT-L6523Z (LFIA) [Sensitivity: 0.2ng/ml]
DMABP-L39	Mouse Anti-PCT monoclonal antibody, clone IN330	**Epitope**: Katacalcin domain (C-term PCT)	Pair with DMABP-L38 (ELISA/LFIA)
CABT-L6523Z	Mouse Anti-PCT monoclonal antibody, clone IN192	**Epitope**: Calcitonin domain (Middle region PCT)	Pair with DMABP-L38 (LFIA) [Sensitivity: 0.2ng/ml]
DCABH-001H	Mouse Anti-PCT monoclonal antibody	**Epitope**: Katacalcin domain (aa 96-116) **Specificity**: React with human PCT **No cross-reaction** with: Canine PCT	Pair with DCABH-002H (LFIA/CLIA)
DCABH-002H	Mouse Anti-PCT monoclonal antibody	**Epitope**: Calcitonin domain (aa 78-81) **Specificity**: React with human PCT	Pair with DCABH-001H (LFIA/CLIA)
DMAB1342MH	Mouse Anti-PCT monoclonal antibody	**Epitope**: Katacalcin domain (aa 90-113) **Specificity**: React with human PCT	
DMAB1337MH	Mouse Anti-PCT monoclonal antibody	**Epitope**: N-term PCT (aa 26-60) **Specificity**: React with human PCT	

Browse More PCT Related Kits and PCT Antigens

CT Antibodies

Cat.	Product Name	Specificity	Applications
DCABY-4599	Mouse Anti-Calcitonin monoclonal antibody, clone 10B11	**Epitope**: Calcitonin domain (QTAIGVGAP) **Specificity**: Reacts with active CT, distinguishing it from the mature CT present in the PCT peptide and increasing the specificity of the assay.	Pair with DCABY-4600 (Best pair for LFIA/CLIA)
DCABY-4600	Mouse Anti-Calcitonin monoclonal antibody, clone 14D11	**Epitope**: Calcitonin domain (DFNKFHT) **Specificity**: Reacts with active CT, distinguishing it from the mature CT present in the PCT peptide and enhancing the specificity of the assay.	Pair with DCABY-4599 (Best pair for LFIA/CLIA)

CD Creative Diagnostics®

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Procalcitonin (PCT) and Calcitonin (CT) Antibodies for Assay Development

CABT-WN1149	Anti-Calcitonin monoclonal antibody, clone 24C0	**Epitope**: Calcitonin domain (aa 60 - 69)	Pair with CABT-WN1112 (ELISA) Pair with CABT-WN1113 (ELISA)
CABT-WN1113	Anti-Calcitonin monoclonal antibody, clone 35C3	**Epitope**: Calcitonin domain (aa 72 - 81)	Pair with CABT-WN1149 (ELISA)
CABT-WN1112	Anti-Calcitonin monoclonal antibody, clone 24G3	**Epitope**: Calcitonin domain (aa 72 - 81)	Pair with CABT-WN1149 (ELISA)

Browse More CT Related Kits and CT Antigens

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CREATIVE DIAGNOSTICS

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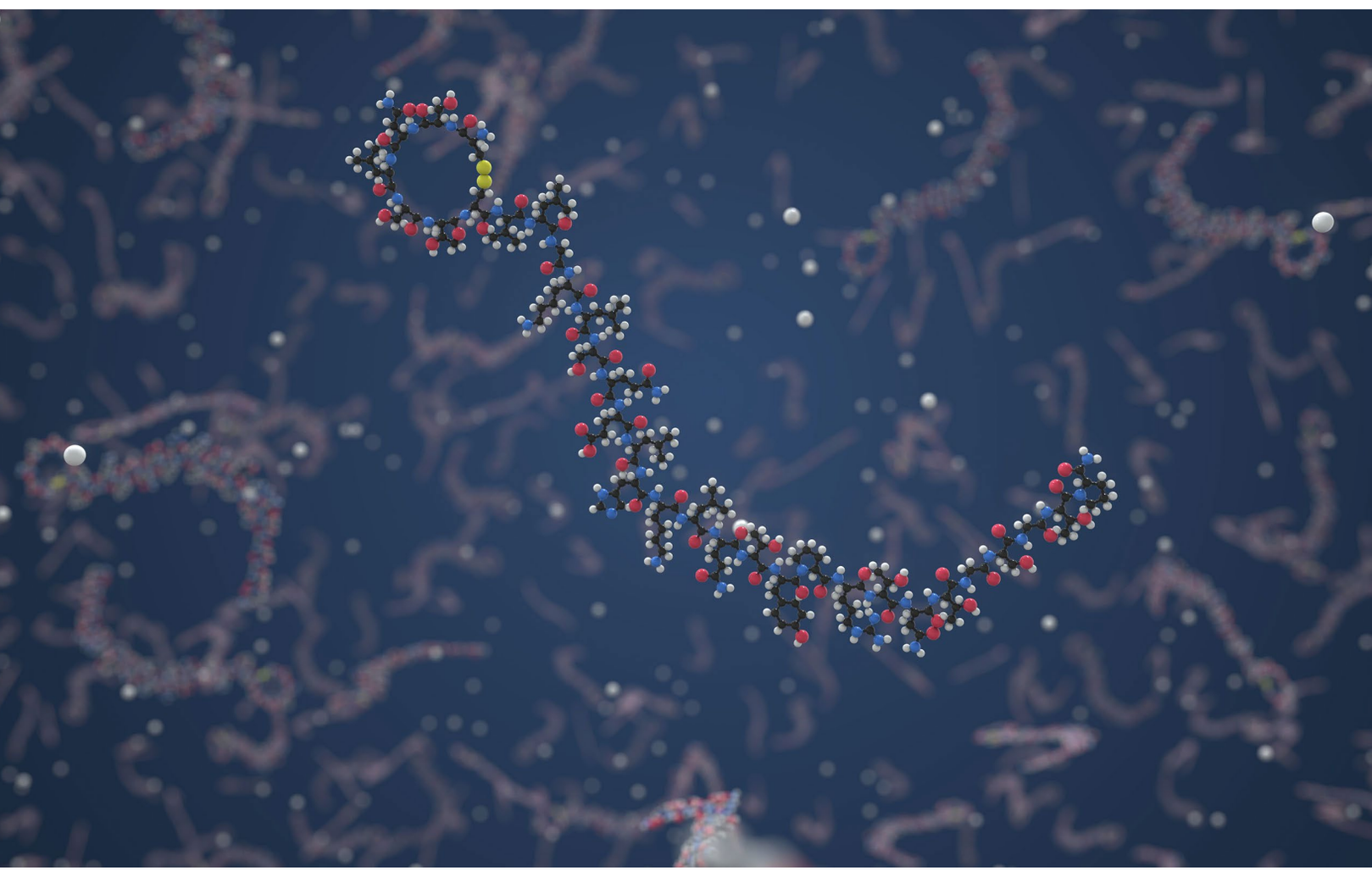

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