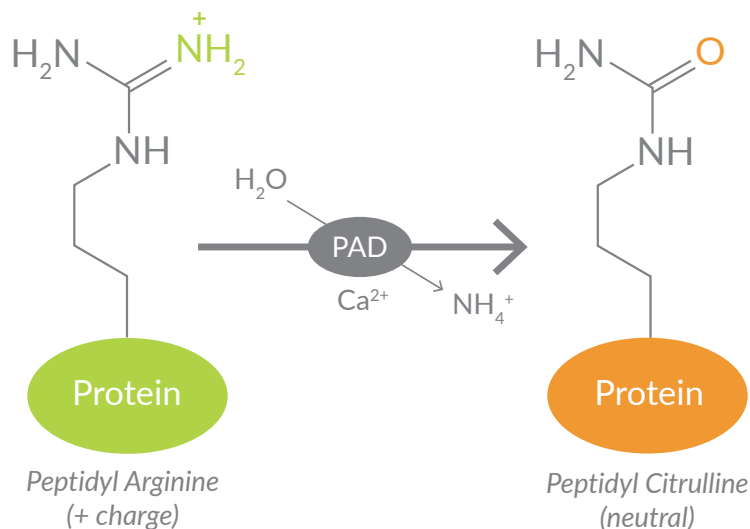


# Citrullination Research Tools

Cayman offers a full set of research tools to study citrullination, a post-translational protein modification linked to numerous inflammatory and autoimmune disorders. While citrullination is most known for its contribution to these pathological processes, it also plays an important role in several physiological functions, including gene regulation and the formation of neutrophil extracellular traps (NETs) in response to immune challenge. We offer a diverse portfolio of research tools for the detection of citrullination and to explore the function of peptidylarginine deiminases (PADs), the catalysts of citrullination, which may hold promise as therapeutic targets.



## Citrullination Targets

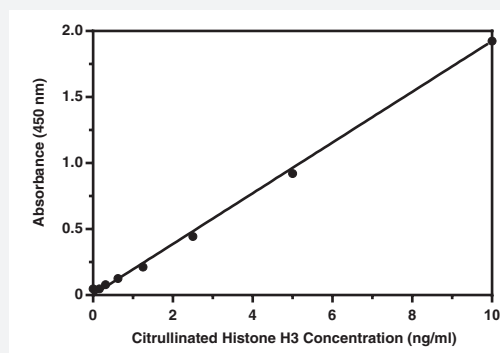
- $\beta$ -Catenin
- Cytokeratin
- $\alpha$ -Enolase
- Fibrinogen
- Filaggrin
- Heat shock proteins
- Histones
- Vimentin
- and more!

## Quantify NET Formation Using a CitH3-Specific ELISA

### Citrullinated Histone H3 (Clone 11D3) ELISA Kit

Item No. 501620

- Detect CitH3 in cell culture supernatants, cell lysates, human plasma, and human serum
- Detect CitH3 from as few as 1,000 neutrophils in human and mouse
- Assay 24 samples in triplicate or 36 samples in duplicate
- Measure CitH3 levels down to 0.15 ng/ml
- Rapid assay; get results in under 4 hours



## PAD & PAD Autoantibody ELISA Kits

Item No.	Product Name	Description
501450	PAD2 (human) ELISA Kit	An ELISA for quantifying human PAD2 in biological fluids
501460	PAD4 (human) ELISA Kit	An immunometric assay for the measurement of PAD4 in tissue culture medium, cell lysates, plasma, and serum
500930	PAD4 Autoantibody ELISA Kit	An immunometric assay for the measurement of anti-PAD4 autoantibodies in human plasma and serum

## Inhibitor Screening Assays

Cayman has developed a set of orthogonal assays to screen large libraries of compounds for next-generation PAD inhibitors. These fluorescence-based assays monitor PAD activity by ammonia detection or by using AMC-tagged arginine as a trypsin substrate.

### Ammonia Detection

Item No.	Product Name
701450	PAD1 Inhibitor Screening Assay Kit (Ammonia)
701400	PAD2 Inhibitor Screening Assay Kit (Ammonia)
700560	PAD4 Inhibitor Screening Assay Kit (Ammonia)

### AMC-tagged Arginine as a Trypsin Substrate

Item No.	Product Name
701440	PAD1 Inhibitor Screening Assay Kit (AMC)
701390	PAD2 Inhibitor Screening Assay Kit (AMC)
701320	PAD4 Inhibitor Screening Assay Kit (AMC)

## PAD Inhibitors

Item No.	Product Name	Description
17079	BB-Cl-Amidine (trifluoroacetate salt)	A pan-PAD inhibitor
33581	BMS-P5	A selective PAD4 inhibitor ( $IC_{50}$ = 98 nM)
38018	CAY10723 (hydrochloride)	A PAD2 inhibitor ( $EC_{50}$ = 9.5 $\mu$ M)
10599	Cl-Amidine (hydrochloride)*	A PAD inhibitor ( $IC_{50}$ s = 0.8, 6.2, and 5.9 $\mu$ M for PAD1, PAD3, and PAD4, respectively)
17488	GSK484 (hydrochloride)	Selective inhibitor of PAD4 ( $IC_{50}$ = 50 nM)

\*Sold under license from the University of South Carolina under U.S. Patent No. 7,964,636

View all PAD inhibitors at [www.caymanchem.com](http://www.caymanchem.com)

## PAD Proteins

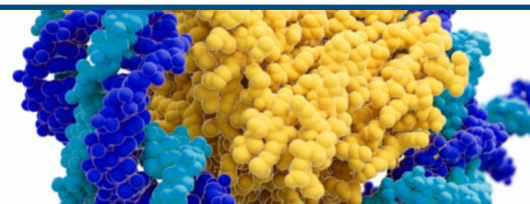
Item No.	Product Name	Description
10784	PAD1 (human, recombinant)	Active N-terminal His-tagged enzyme expressed in <i>E. coli</i>
10785	PAD2 (human, recombinant)	Active N-terminal His-tagged enzyme expressed in insect cells
10786	PAD3 (human, recombinant)	Active N-terminal His-tagged enzyme expressed in <i>E. coli</i>
10500	PAD4 (human, recombinant)	Active N-terminal His-tagged enzyme expressed in <i>E. coli</i>
32834	PAD4 (human, recombinant; mammalian expressed)	Recombinant N-terminal His-tagged human PAD4 expressed in HEK293 cells
28910	PAD4 (mouse, recombinant)	Active recombinant N-terminal His-tagged protein expressed in insect cells
24615	PAD6 (human, recombinant)	N-terminal His-tagged enzyme expressed in insect cells

## PAD Antibodies

Item No.	Product Name	Species Reactivity	Application(s)
22997	PAD1 Monoclonal Antibody (Clone 6B4)	(+) Human	ELISA, WB
19822	PAD2 Monoclonal Antibody (Clone 9F7)	(+) Human	ELISA, IHC, WB
33887	PAD2 Polyclonal Antibody	(+) Human	ELISA, WB
24377	PAD3 Monoclonal Antibody (Clone 4E5)	(+) Human	ELISA, IF, WB
33913	PAD3 Polyclonal Antibody	(+) Human	IHC
19671	PAD4 Monoclonal Antibody (Clone 11F9)	(+) Human	ELISA, WB
33914	PAD4 Polyclonal Antibody	(+) Human	ELISA
25965	PAD6 Monoclonal Antibody (Clone 4B7)	(+) Human	ELISA, WB

## Custom Citrullination Services

A recognized leader in providing citrullination research tools, we extend our expertise by offering custom citrullination services to suit individual project needs.



## Unmodified Histones

Item No.	Product Name	Description
11010	Core Histones (human)	Highly purified mixture of human core histones (H2A, H2B, H3, and H4)
33943	Histone H1 (bovine)	Histones H1.2-H1.4 isolated from calf thymus
10261	Histone H2A ( <i>Xenopus</i> , recombinant)	Recombinant histone H2A expressed in <i>E. coli</i>
11080	Histone H2A Type 1 (human, recombinant)	Recombinant human histone H2A type 1 expressed in <i>E. coli</i>
10262	Histone H2B ( <i>Xenopus</i> , recombinant)	Recombinant protein expressed in <i>E. coli</i>
11081	Histone H2B Type 1-A (human, recombinant)	Recombinant human histone H2B type 1-A expressed in <i>E. coli</i>
10263	Histone H3 (human, recombinant)	Recombinant human histone H3 expressed in <i>E. coli</i>
10264	Histone H4 (human, recombinant)	Recombinant human protein expressed in <i>E. coli</i>
38257	Histone H4 (human, recombinant; His-tagged)	Recombinant human N-terminal His-tagged histone H4 expressed in <i>E. coli</i>

## Citrullinated Histones

Item No.	Product Name	Description
20582	Citrullinated Core Histones (bovine)	Mixture of H1, H2A, H2B, H3, and H4 histones isolated from calf thymus and modified by PAD4
30132	Citrullinated Histone H2A Type 1 (human, recombinant)	Recombinant human histone H2A type 1 expressed in <i>E. coli</i> , citrullinated by PAD4
30133	Citrullinated Histone H2B (human, recombinant)	Recombinant human histone H2B type 1-A expressed in <i>E. coli</i> , citrullinated by PAD4
17926	Citrullinated Histone H3 (human, recombinant)	Recombinant human histone H3 expressed in <i>E. coli</i> , citrullinated by PAD4
37626	Citrullinated Histone H3 (R2 + R8 + R17) (2-22)-biotin Peptide	A biotinylated and citrullinated histone H3 peptide
17927	Citrullinated Histone H4 (human, recombinant)	Recombinant protein expressed in <i>E. coli</i> , citrullinated by human recombinant PAD4
38258	Citrullinated Histone H4 (human, recombinant; His-tagged)	Recombinant human N-terminal His-tagged histone H4 expressed in <i>E. coli</i> , citrullinated by PAD4
27769	Histone H3 (Citrullinated R26) (21-44)-GGK-biotin Peptide (trifluoroacetate salt)	A biotinylated peptide fragment of histone H3

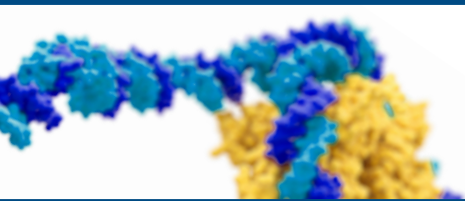
## Citrullinated Histones and Antibodies

Item No.	Product Name	Species Reactivity	Application(s)
18073	Histone H1.4 (Citrullinated R53) Polyclonal Antibody	(+) Human	WB
17939	Histone H3 (Citrullinated R2 + R8 + R17) Monoclonal Antibody (Clone 11D3)	(+) Human	ELISA, WB
17855	Histone H3 (Citrullinated R2 + R8 + R17) Polyclonal Antibody	(+) Human	ELISA, WB
40359	Histone H3 (Citrullinated R2 + R8 + R17) Recombinant Monoclonal Antibody	(+) Human	ELISA, WB

## Tools to Investigate NETosis

PADs catalyze histone H3 hypercitrullination during NET formation. Cayman has developed a collection of tools to study this form of cell death.

Item No.	Product Name	Description
501410	Myeloperoxidase (human) ELISA Kit	Detect human MPO in cell culture supernatants, plasma, and serum
601010	NETosis Assay Kit	Induce and detect NET formation <i>in vitro</i>
601070	Neutrophil (mouse) Isolation Kit	Isolate mouse neutrophils from peritoneal lavage or bone marrow



- [▶ Citrullinated protein & peptide production](#)
- [▶ Citrullinated target-specific antibody production](#)
- [▶ Citrullinated proteome profiling](#)
- [▶ Assay development services](#)

Learn more at [www.caymanchem.com/proteinproduction](http://www.caymanchem.com/proteinproduction)

Other Citrullinated Proteins

Item No.	Product Name	Description
30986	Citrullinated Amyloid-β (1-42) Peptide (human)	A citrullinated form of Aβ42
29921	Citrullinated β-Catenin (human, recombinant)	Recombinant N-terminal His-tagged human β-catenin expressed in <i>E. coli</i> , citrullinated by PAD2
21585	Citrullinated α-Enolase (human, recombinant)	Recombinant enolase expressed in <i>E. coli</i> , citrullinated by PAD4
28622	Citrullinated GFAP (human, recombinant)	Recombinant N-terminal His-tagged GFAP expressed in <i>E. coli</i> , citrullinated by PAD2
25107	Citrullinated GRP78 (human, recombinant)	N-Terminal His-tagged human GRP78 purified from <i>E. coli</i> , citrullinated by PAD2
25108	Citrullinated Hsp70 (human, recombinant)	N-Terminal His-tagged human Hsp70 purified from <i>E. coli</i> , citrullinated by PAD2
30173	Citrullinated Interleukin-6 (human, recombinant)	Recombinant human N-terminal His-tagged IL-6 expressed in HEK293 cells, citrullinated by PAD4
30987	Citrullinated LL-37 Peptide	A citrullinated form of LL-37
37780	Citrullinated Nucleophosmin (human, recombinant)	Recombinant human N-terminal His-TEV-tagged NPM1 expressed in <i>E. coli</i> , citrullinated by PAD4
21942	Citrullinated Vimentin (human, recombinant)	Human recombinant vimentin purified from <i>E. coli</i>
18473	Human Fibrinogen (PAD2 Citrullinated)	Fibrinogen purified from human plasma negative for HBsAg and HIV and HCV antibodies, citrullinated with PAD2
400076	Human Fibrinogen (PAD4 Citrullinated)	Fibrinogen purified from human plasma negative for HBsAg and HIV and HCV antibodies, citrullinated with PAD4

Antibodies for Citrullinated Proteins

Item No.	Product Name	Species Reactivity	Application(s)
17088	Citrullinated Fibrinogen Monoclonal Antibody (Clone 10E9.3)	(+) Human	ELISA, WB
27795	Citrullinated GFAP (R416) Monoclonal Antibody (Clone 4B8)	(+) Human	ELISA, IHC, WB
24497	Citrullinated Hsp70 (R155) Polyclonal Antibody	(+) Human	ELISA, WB
36178	Citrullinated Interleukin-6 Polyclonal Antibody	(+) Human	ELISA, WB
26739	Citrullinated LL-37 Monoclonal Antibody (Clone 6A8)	(+) Human	ELISA, WB
26742	Citrullinated Myelin Basic Protein Polyclonal Antibody	(+) Human	ELISA, WB
22054	Citrullinated Vimentin Monoclonal Antibody (Clone 12G11)	(+) Human	ELISA, IP, WB
34123	Citrullinated α-Enolase Monoclonal Antibody (Clone 4A7)	(+) Human	ELISA, WB

Featured Product

Anti-Citrulline Monoclonal Antibody (Clone 1D9)

Item No. 30773

For immunochemical detection of citrullinated proteins and peptides

Lanes 1 and 2 were immunoprecipitated using Cayman’s Anti-Citrulline Monoclonal Antibody (Clone 1D9) (Item No. 30773) and probed with Cayman’s GFAP Polyclonal Antibody (Item No. 28848).

Lanes 3 and 4 were immunoprecipitated using Cayman’s Anti-Citrulline Monoclonal Antibody (Clone 1D9) (Item No. 30773) and probed with Cayman’s Fibrinogen (α chain) Polyclonal Antibody (Item No. 18033).

Applications:

ELISA, IF, IHC, IP, WB



Lane 1	GFAP (human, recombinant) (Item No. 27353)
Lane 2	Citrullinated GFAP (human, recombinant) (Item No. 28622)
Lane 3	Human Fibrinogen
Lane 4	Human Fibrinogen (PAD4 Citrullinated) (Item No. 400076)