



# FROM HEAD TO TOE!







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- Comprehensive panel of over 100 antibodies
- Monoclonal & polyclonal antibodies
- Protocols for relevant applications
- Publication records available
- Expert scientific support

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 PROGEN provides a unique range of premium keratin antibodies for research on keratins in health and disease. All of our antibodies are carefully quality controlled and validated, showing long publication records. Our products have been used in numerous kinds of applications and we are happy to provide scientific & practical support!

### ATLAS OF PROGEN'S KERATIN ANTIBODIES

	<b>Lung:</b> K7 (61025, 65025, GP-K7), K8 (65130, 61038, GP-K8, 65137, 65128, GP-Ck18, 61034, 65028, 11416, 61528, 61428), K19 (61010, 65129, 65010, 11417, GP-Ck19, 61029, 65135, 61429)		<b>Prostate:</b> K8 (65130, 61038, GP-K8, 65137, 65128, GP-Ck18, 61034, 65028, 11416, 61528, 61428), K19 (61010, 65129, 65010, 11417, GP-Ck19, 61029, 65135, 61429)		<b>Kidney:</b> K7 (61025, 65025, GP-K7), K8 (65130, 61038, GP-K8, 65137, 65128, GP-Ck18, 61034, 65028, 11416, 61528, 61428), K19 (61010, 65129, 65010, 11417, GP-Ck19, 61029, 65135, 61429)		<b>Colon:</b> K7 (61025, 65025, GP-K7), K8 (65130, 61038, GP-K8, 65137, 65128, GP-Ck18, 61034, 65028, 11416, 61528, 61428), K19 (61010, 65129, 65010, 11417, GP-Ck19, 61029, 65135, 61429)
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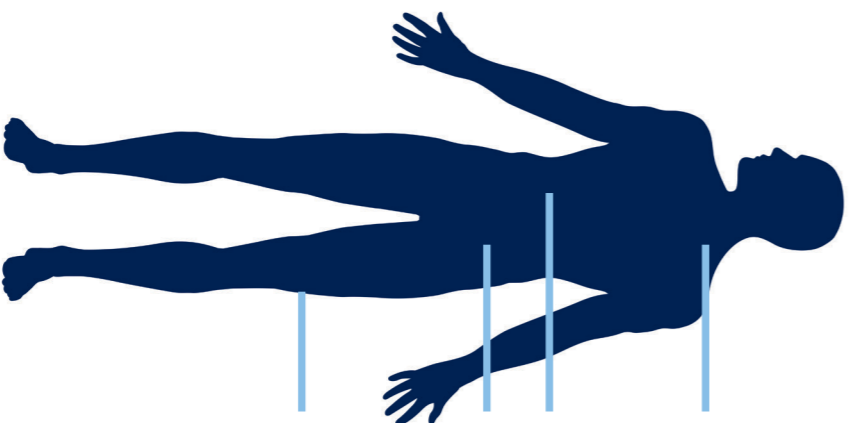


**Ovary:** K7 (61025, 65025, GP-K7), K8 (65130, 61038, GP-K8, 65137, 65128, GP-Ck18, 61034, 65028, 11416, 61528, 61428), K19 (61010, 65129, 65010, 11417, GP-Ck19, 61029, 65135, 61429)

**Cervix:** K4 (GP-K4), K5 (GP-Ck5), K6 (GP-91, 61090, GP-K6, 65190), K7 (61025, 65025, GP-K7), K8 (65130, 61038, GP-K8, 65137, 65128, GP-Ck18, 61034, 65028, 11416, 61528, 61428), K14 (GP-Ck14), K15 (GP-Ck15, GP-K15), K16 (GP-K16), K17 (65136, GP-Ck17, 61036), K18 (61028, 65134, GP-K18, 65137, 65128, GP-Ck18, 61034, 65028, 11416, 61528, 61428), K19 (61010, 65129, 65010, 11417, GP-Ck19, 61029, 65135, 61429)

**Uterus:** K5 (GP-Ck5), K7 (61025, 65025, GP-K7), K8 (65130, 61038, GP-K8, 65137, 65128, GP-Ck18, 61034, 65028, 11416, 61528, 61428), K19 (61010, 65129, 65010, 11417, GP-Ck19, 61029, 65135, 61429)

**Breast:** K5 (GP-Ck5), K6 (GP-91, 61090, GP-K6, 65190), K7 (61025, 65025, GP-K7), K8 (65130, 61038, GP-K8, 65137, 65128, GP-Ck18, 61034, 65028, 11416, 61528, 61428), K14 (GP-Ck14), K17 (65136, GP-Ck17, 61036), K18 (61028, 65134, GP-K18, 65137, 65128, GP-Ck18, 61034, 65028, 11416, 61528, 61428), K19 (61010, 65129, 65010, 11417, GP-Ck19, 61029, 65135, 61429)



**Mesothelium:** K5 (GP-Ck5), K7 (61025, 65025, GP-K7), K8 (65130, 61038, GP-K8, 65137, 65128, GP-Ck18, 61034, 65028, 11416, 61528, 61428), K19 (61010, 65129, 65010, 11417, GP-Ck19, 61029, 65135, 61429), K20 (65054, 61033, GP-K20, 61032, 65026, 65133, 61054, 65154, 65133, 61454)

**Biliary Tract:** K7 (61025, 65025, GP-K7), K8 (65130, 61038, GP-K8, 65137, 65128, GP-Ck18, 61034, 65028, 11416, 61528, 61428), K19 (61010, 65129, 65010, 11417, GP-Ck19, 61029, 65135, 61429), K20 (65054, 61033, GP-K20, 61032, 65026, 65133, 61054, 65154, 65133, 61454)

**Pancreas:** K7 (61025, 65025, GP-K7), K8 (65130, 61038, GP-K8, 65137, 65128, GP-Ck18, 61034, 65028, 11416, 61528, 61428), K19 (61010, 65129, 65010, 11417, GP-Ck19, 61029, 65135, 61429), K20 (65054, 61033, GP-K20, 61032, 65026, 65133, 61054, 65154, 65133, 61454)

**Skin:** K7 (61025, 65025, GP-K7), K8 (65130, 61038, GP-K8, 65137, 65128, GP-Ck18, 61034, 65028, 11416, 61528, 61428), K19 (61010, 65129, 65010, 11417, GP-Ck19, 61029, 65135, 61429), K20 (65054, 61033, GP-K20, 61032, 65026, 65133, 61054, 65154, 65133, 61454)



**Liver:** K8 (65130, 61038, GP-K8, 65137, 65128, GP-Ck18, 61034, 65028, 11416, 61528, 61428), K19 (61010, 65129, 65010, 11417, GP-Ck19, 61029, 65135, 61429)



**Stomach:** K7 (61025, 65025, GP-K7), K8 (65130, 61038, GP-K8, 65137, 65128, GP-Ck18, 61034, 65028, 11416, 61528, 61428), K19 (61010, 65129, 65010, 11417, GP-Ck19, 61029, 65135, 61429), K20 (65054, 61033, GP-K20, 61032, 65026, 65133, 61054, 65154, 65133, 61454)

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When PROGEN was founded in 1983, keratins have just been discovered as fibrous proteins that make up the intermediate filaments in epithelial cells. One of the company's co-founders, Prof. Dr. Werner Franke from the German Cancer Center in Heidelberg and a pioneer in keratin research, greatly contributed to the development of PROGEN'S comprehensive portfolio of keratin antibodies and to our wealth of knowledge on their applications in research and diagnostics.

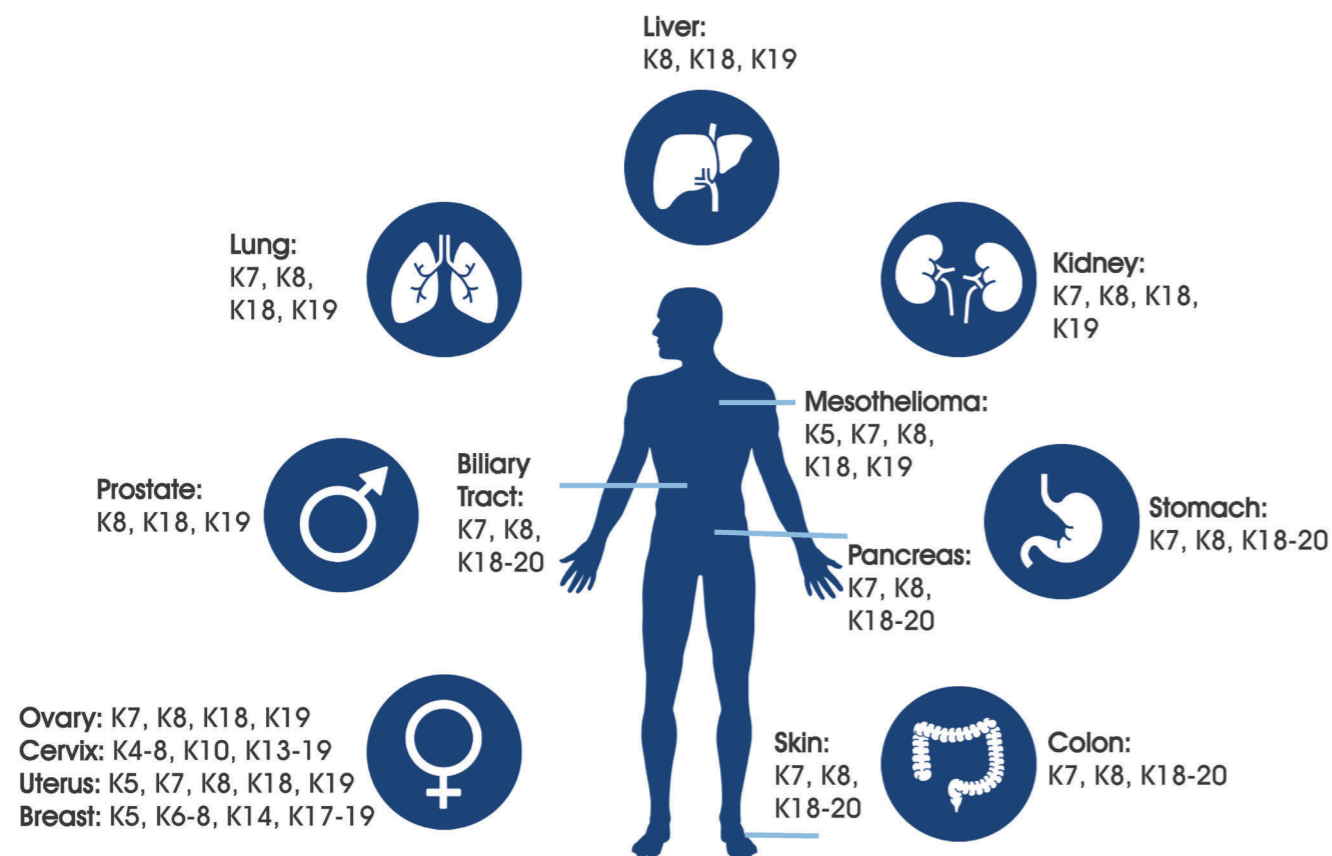
## Keratins – more than structural components

Keratins are a large protein family. Expression and structure of its members is highly tissue and differentiation specific. As heteropolymers, keratins form intermediate filaments (IFs) with the primary task of providing a structural framework in epithelial cells that protects them from mechanical and non-mechanical stress. In addition, keratins are involved in establishing apico-basal polarization, regulating motility and cell size and even play a role in complex cellular events such as protein synthesis, membrane traffic or cell signaling [reviewed by Karantz, 2011].

## Ubiquitous marker in health and disease

The expression of the 28 type I (acidic) keratins and 26 type II (basic or neutral) keratins in epithelia and hair is highly regulated in response to internal or external stimuli and stressors. Along with post-translational modifications and structural reorganization of these proteins, a distinct expression and organisational pattern of keratins is typical for the different epithelial tissues. Not surprisingly, anomalies in keratin expression or function is often associated with disease: More than 60 different disorders have been linked to inherited keratin changes. For example, keratin overexpression is seen in various liver diseases, whereas keratin mutations cause epithelial disorders, including cancer.

## Tissue specific expression of human keratins (K4 – K20)



## Keratins in Cancer

### Keratins are principal markers in cancer diagnosis and prognosis

Keratins are popular diagnostic markers in cancer because of their typical signature for tumor cell type and differentiation, while maintaining the specific expression pattern associated with the cell type of origin. Commonly used markers in the immunohistochemical analysis of tumors are K5-K8 and K18-K20. Adenocarcinomas (epithelial cancers arising in glandular tissues) build up the largest group of human epithelial malignancies. As they can originate in various organs, the ability of differentiating a carcinoma according to the tissue of origin is crucial. By using epithelial keratins as diagnostic markers, the best treatment depending on the exact type of cancer can be determined. In general, most adenocarcinomas express K8, K18 and K19. K7 and K20 levels vary depending on cancer type. In unclear cases, keratin typing is often key to assess the correct tumor type. Beyond their role as diagnostic markers, keratins are also useful prognostic indicators in epithelial malignancies. For instance, in colorectal cancer, reduced expression of K8 and K20 has been associated with epithelial to mesenchymal cancer cell transition – an indicator for higher tumor aggressiveness.

Apart from being diagnostic and prognostic markers, several studies support an active role of keratins (e.g. K8 and K18) in cancer cell invasion and metastasis, pointing to a functional role of keratins in tumorigenesis. Further research will reveal whether pharmacological keratin modulation can be used as an adjunct to chemotherapy for improving therapeutic outcomes.

### Suggested reading

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## Keratins as prognostic markers in tumor pathology

Cancer Site	Keratin Expression Pattern	Detection Site	Prognosis
Biliary duct	High K19 fragment (CYFRA21-1)	Serum	Worse
Breast	K5/6, K17	Tumor	Worse
	K19 mRNA	CTCs	Worse
	Reduced K18 mRNA	Tumor	Worse
	Ubiquitinated K8 and K18 fragments	Tumor	Worse
Colon	Reduced K8, K20	Tumor	Worse
	Persistent or higher K18 fragment (M30) after primary tumor resection	Serum	Worse
Kidney	K8, K18	CTCs	Worse
	K7, K19	Tumor	Better
Liver	K10, K19	Tumor	Worse
Lung	High K18 fragment	Serum	Worse
	K20	Tumor	Worse
Pancreas	K20	Serum	Worse
	K20	Serum	Worse
Prostate	K8, K18, K19 before surgery	Bone marrow	Worse
Skin (melanoma)	K18	Tumor	Worse
Stomach	K20	Peritoneal fluid	Worse
Uterus	Loss of K5/K6	Tumor	Worse