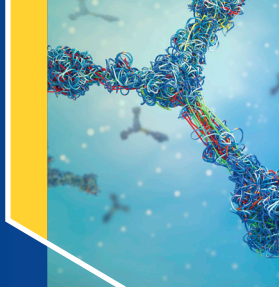


R&D TRENDS: THE GROWING POTENTIAL OF ANTIBODY DRUG CONJUGATES



Overview

The antibody-drug conjugate (ADC) research landscape is rapidly evolving, driven by advancements in target selection, linker technology, and drug payloads. These innovations are reshaping ADCs into promising therapies for the targeted treatment of cancer and other diseases.

Background: ADCs are among the most promising drug classes in oncology because of their ability to target cytotoxic agents to specific tumor sites.

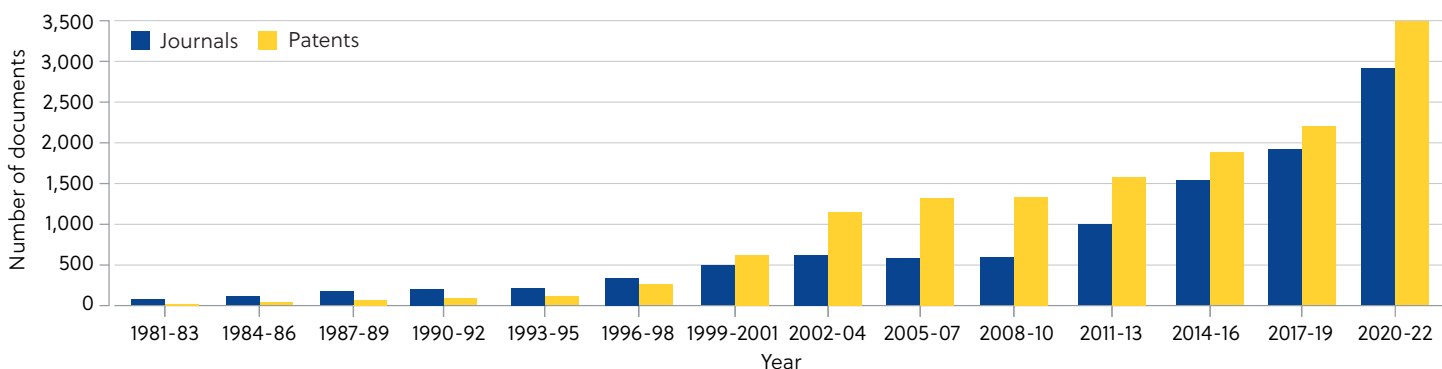
Market potential: The global ADC market, valued at \$8.6 billion as of 2022, is expected to grow at a CAGR of around 10.7% in the next decade. The market size is expected to reach \$23.9 billion by 2032.

Key benefits: Recent advances in ADC research have led to improvements in target selection, linker technology, drug payloads, and improved antibody engineering, thereby enhancing their efficacy and safety profiles.

Key challenges: Challenges related to target identification, resistance, manufacturing, and safety must be addressed to fully realize the potential of ADCs in widespread therapeutic use beyond oncology.

The rise of ADC research

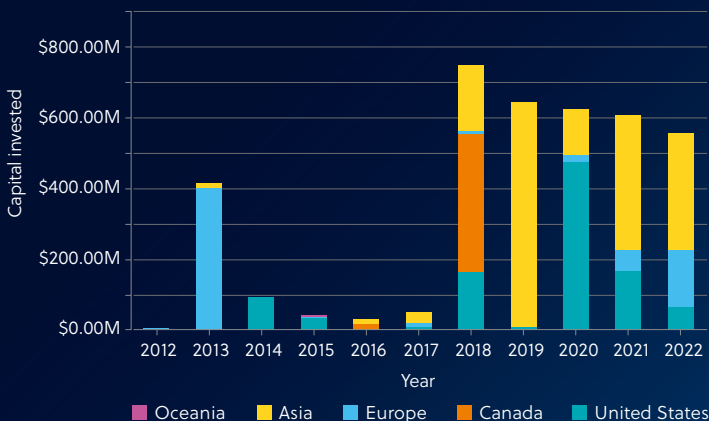
The number of ADC publications has grown in recent years, indicating an increased interest. Patents have now surpassed journal publications, reflecting increasing commercial interest in ADCs and the translation of academic discoveries in ADC research into clinical applications.



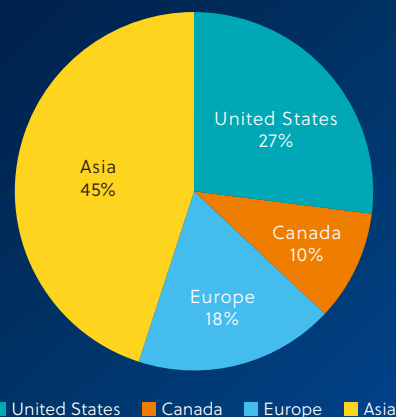
ADCs and their growing commercial potential

Following a dramatic and substantial spike in venture capital investment in 2018, market interest in ADCs has remained steady, with over \$600 million capital invested. Asia is leading the way with total capital investment, followed by the United States.

Venture capital investment

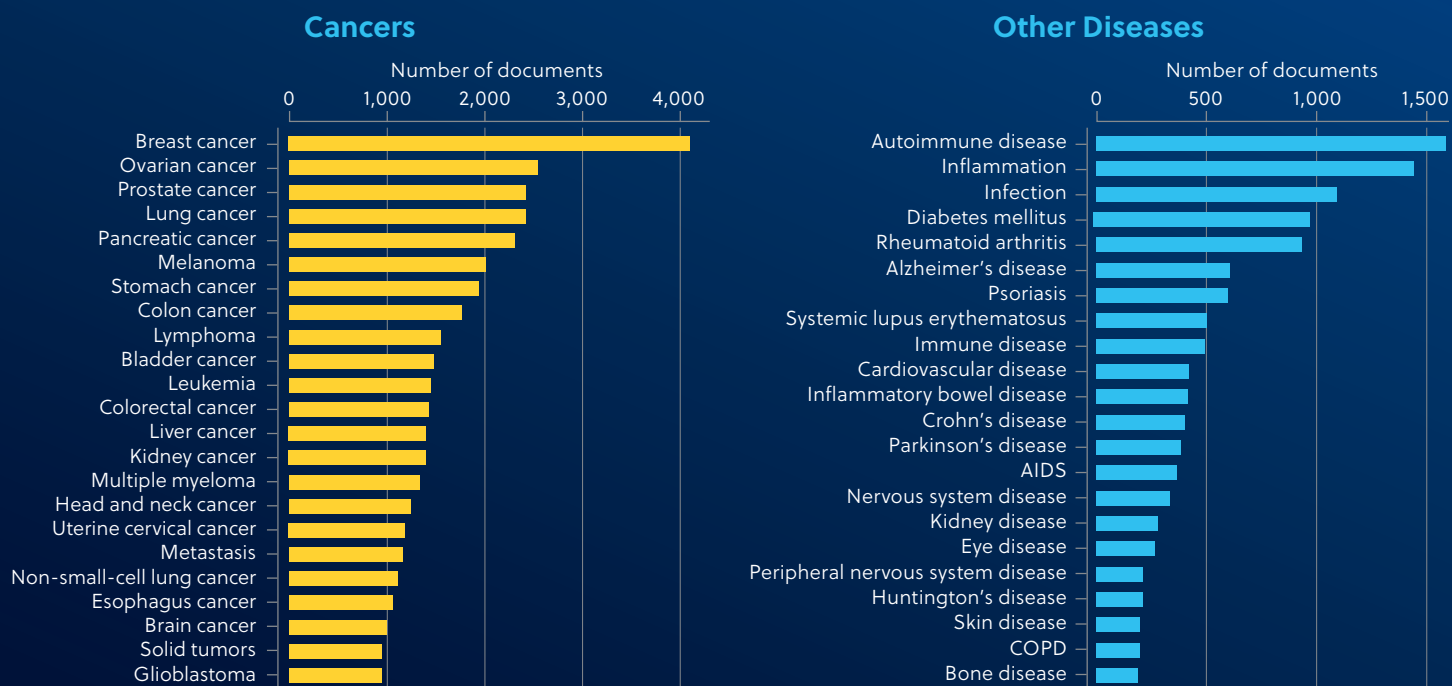


Total capital investment



The expanding diversity of ADC disease applications

While ADCs have shown notable promise in oncology, their development for non-cancer applications presents several challenges due to target selectivity and payload toxicity. Yet, with the advancement of ADC platforms and technology, ADCs for other diseases are being developed.



ADC clinical trials: The current status

Nearly all ADC clinical trials target the treatment of both solid tumors and hematological malignancies. ADC research is more advanced in breast, gastric, bladder, and lung cancers, with the highest proportion of late-stage trials.

Percentage of ADC clinical trials in various phases for the treatment of specific solid tumors and hematological malignancies

Indication	Early Phase I	Phase I	Phase I/II	Phase II	Phase II/III	Phase III	Phase IV
Prostate cancer	0%	41%	30%	30%	0%	0%	0%
Melanoma	5%	36%	32%	27%	0%	0%	0%
Brain cancer	29%	0%	7%	64%	0%	0%	0%
Bone cancer	0%	0%	25%	75%	0%	0%	0%
Pancreatic cancer	0%	55%	19%	24%	2%	0%	0%
Colorectal cancer	0%	41%	18%	38%	0%	0%	3%
Head and neck cancer	0%	33%	37%	26%	4%	0%	0%
Esophageal cancer	0%	45%	22%	27%	0%	6%	0%
Gynecologic cancer	0%	38%	24%	29%	9%	0%	0%
Lung cancer	0%	31%	28%	33%	0%	9%	0%
Bladder cancer	0%	29%	22%	37%	0%	10%	2%
Gastric cancer	0%	30%	17%	40%	1%	11%	1%
Breast cancer	1%	27%	17%	37%	2%	16%	1%
Melanoma	0%	35%	38%	19%	8%	0%	0%
Lymphoma	1%	23%	16%	50%	1%	9%	1%
Myelodysplastic syndromes	0%	27%	8%	55%	8%	4%	0%
Leukemia	2%	26%	11%	42%	3%	13%	3%

Looking ahead

Despite their sophisticated design, ADCs are still associated with limitations and the emergence of resistance mechanisms. As researchers work to overcome these limitations, it's possible that the scope of ADCs could expand beyond cancer treatment to include a wider range of therapeutic applications.

Learn more at cas.org/insights

More comprehensive information and references can be found at cas.org/ADC

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