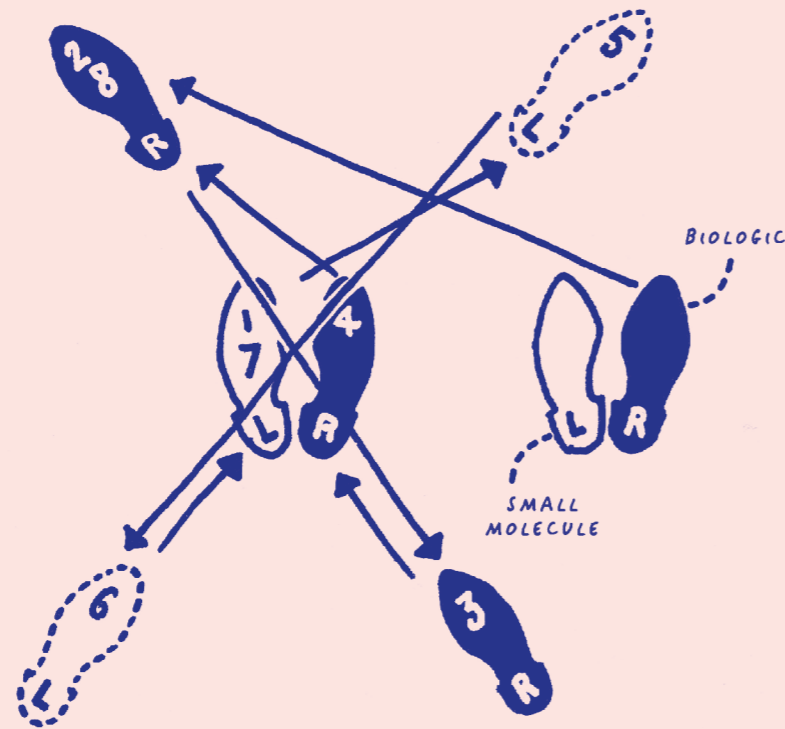


EVOTEC STEPS INTO BIOLOGICS:

DANCING WITH ALL MODALITIES



Choosing the right approach with the best technology platform In drug discovery & development, there are two ways to classify the molecules used: *small and large molecules*. They differ on size, how they are made, how they behave, their mode of action in

the body and how suitable they are for different drug forms. More than 90% of current on-the-market drugs are small molecules, but large molecules, also known as biologics, are quickly rising in popularity and importance.

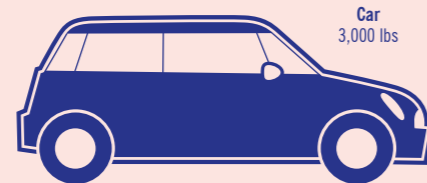
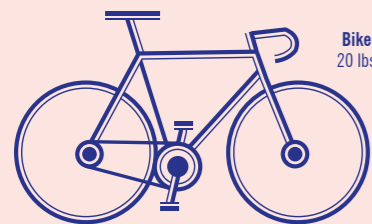
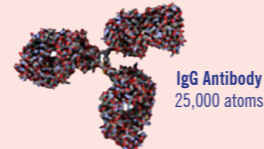
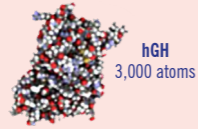
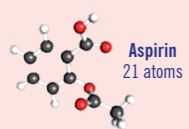
Differentiation Small molecule and Biologics are in

- ▶ Size
- ▶ Behavior
- ▶ Mode of action
- ▶ Manufacturing
- ▶ Complexity

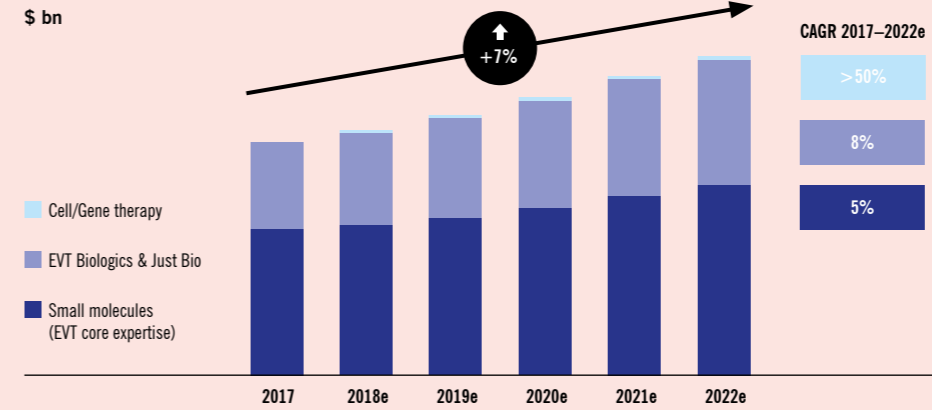
SMALL MOLECULE DRUG

LARGE MOLECULE DRUG

LARGE BIOLOGIC



Global pharmaceutical market



The global biologics market was worth \$221 billion in 2017 and is essentially segmented into monoclonal antibodies, therapeutic proteins and vaccines.

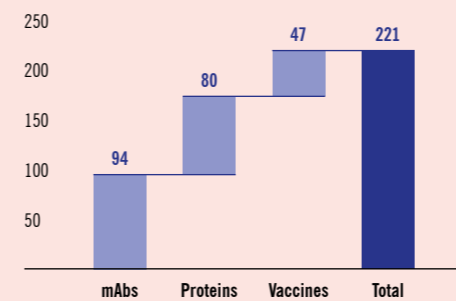
DID YOU KNOW?
THE FIRST BIOLOGIC (HUMAN INSULIN) WAS MARKETED IN 1982.

>5,000
BIOLOGICS CURRENTLY IN THE PIPELINE

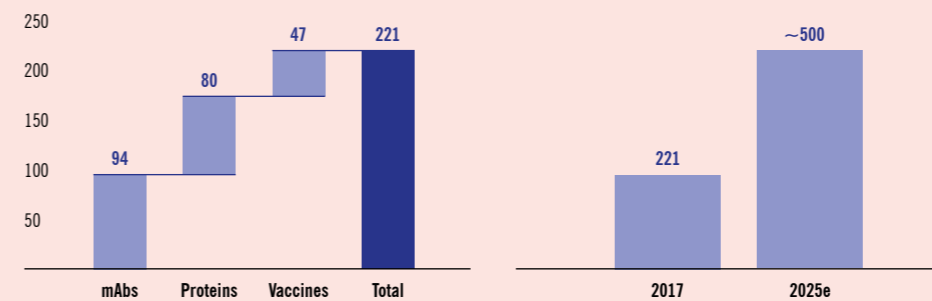
~\$77,9 BN
OVERALL REVENUES OF TOP 10 BIOLOGICS IN 2017

Biologics market

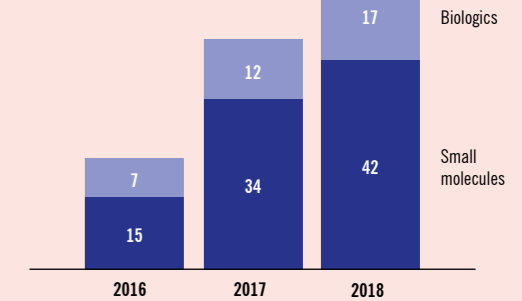
Global sales in 2017 in \$ bn



2017 vs. 2025e



FDA approvals



New clinical trials of monoclonal antibodies have grown 115% in the last ten years. The commercial pipeline is robust, with over 570 antibody therapeutics at various clinical phases, including 62 in late-stage clinical studies.

Top 10 biologics in 2018

NAME	COMPANY	GLOBAL SALES (BN \$)	THERAPEUTIC AREA
Humira	Abbvie	19.9	Inflammation
Opdivo	BMS	7.6	Oncology
Keytruda	Merck & Co	7.2	Oncology
Enbrel	Amgen & Pfizer	7.1	Inflammation
Herceptin	Roche	7.0	Oncology
Avastin	Roche	6.8	Oncology
Rituxan	Roche & Biogen	6.8	Oncology
Remicade	Johnson & Johnson	5.9	Inflammation
Stelara	Johnson & Johnson	5.2	Inflammation
Lantus	Sanofi	4.4	Diabetes

Top 10 pharma players by biologic sales

#	COMPANY	2017 (BN \$)
1	F. Hoffmann-La Roche Ltd	34,857
2	AbbVie Inc	19,844
3	Amgen Inc	18,962
4	Novo Nordisk A S	16,165
5	Johnson & Johnson	14,661
6	Sanofi	12,851
7	Merck & Co Inc	12,372
8	Pfizer Inc	11,288
9	Eli Lilly and Co	10,226
10	Bristol-Myers Squibb Co	8,689

Sources: www.biopharmatrend.com/post/67-will-small-molecules-sustain-pharmaceutical-race-with-biologics; EvaluatPharma, www.genengnews.com/a-lists/top-15-best-selling-drugs-of-2018; www.tandfonline.com/doi/full/10.1080/19420862.2018.1556465; www.globaldata.com/new-clinical-trials-mono-clonal-antibodies-grown-115-last-ten-years; www.thebalance.com/top-biologic-drugs-2663233; PMIlive.com https://sagentbiosimilars.com/learning-about-biosimilars/