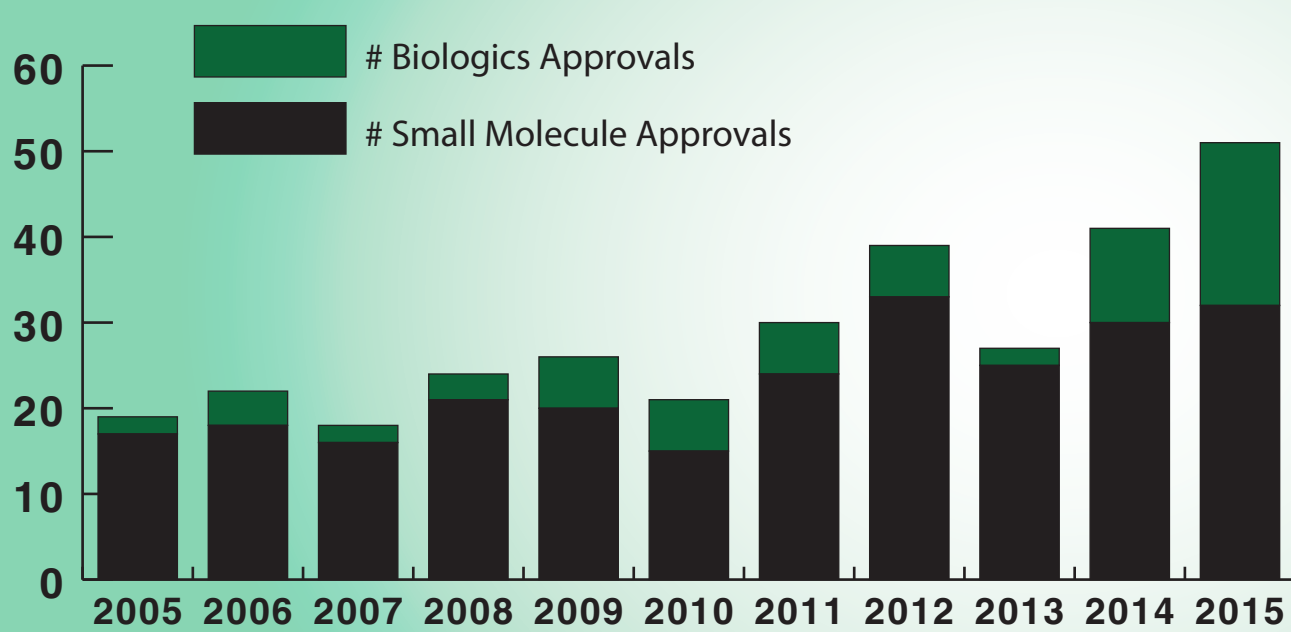
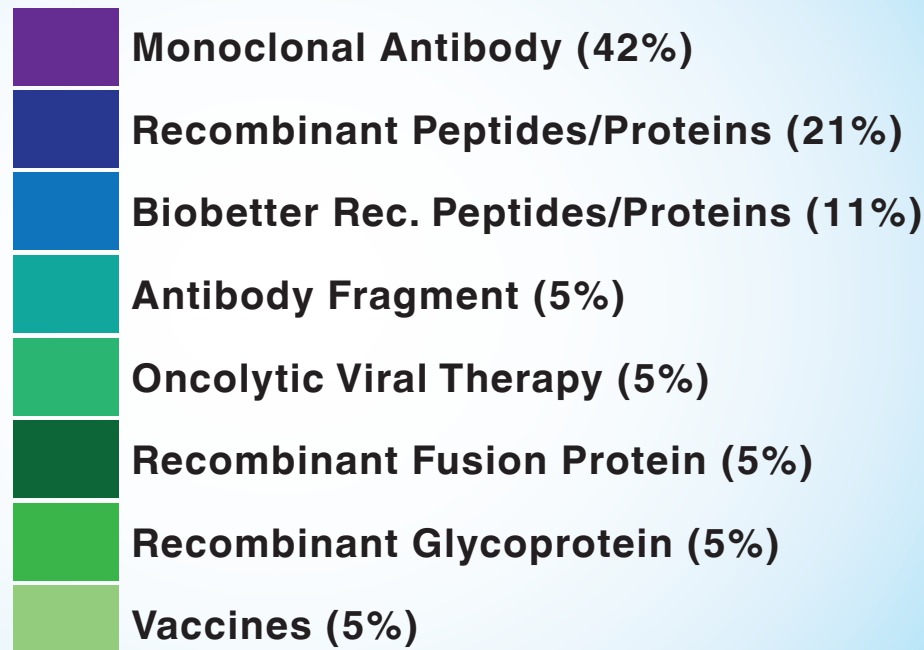
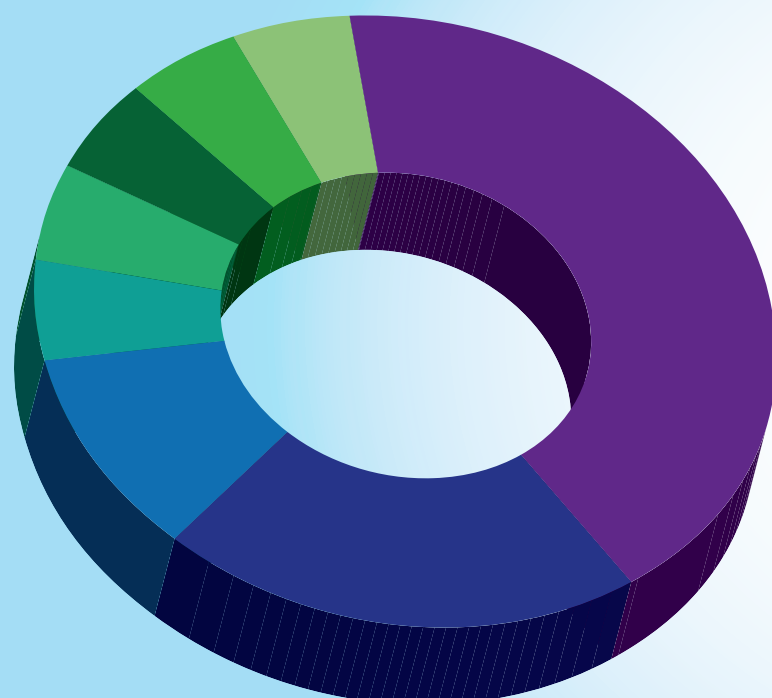


THE RISE & DIVERSIFICATION OF BIOLOGICS

NEW DRUG APPROVALS: A HISTORICAL OVERVIEW

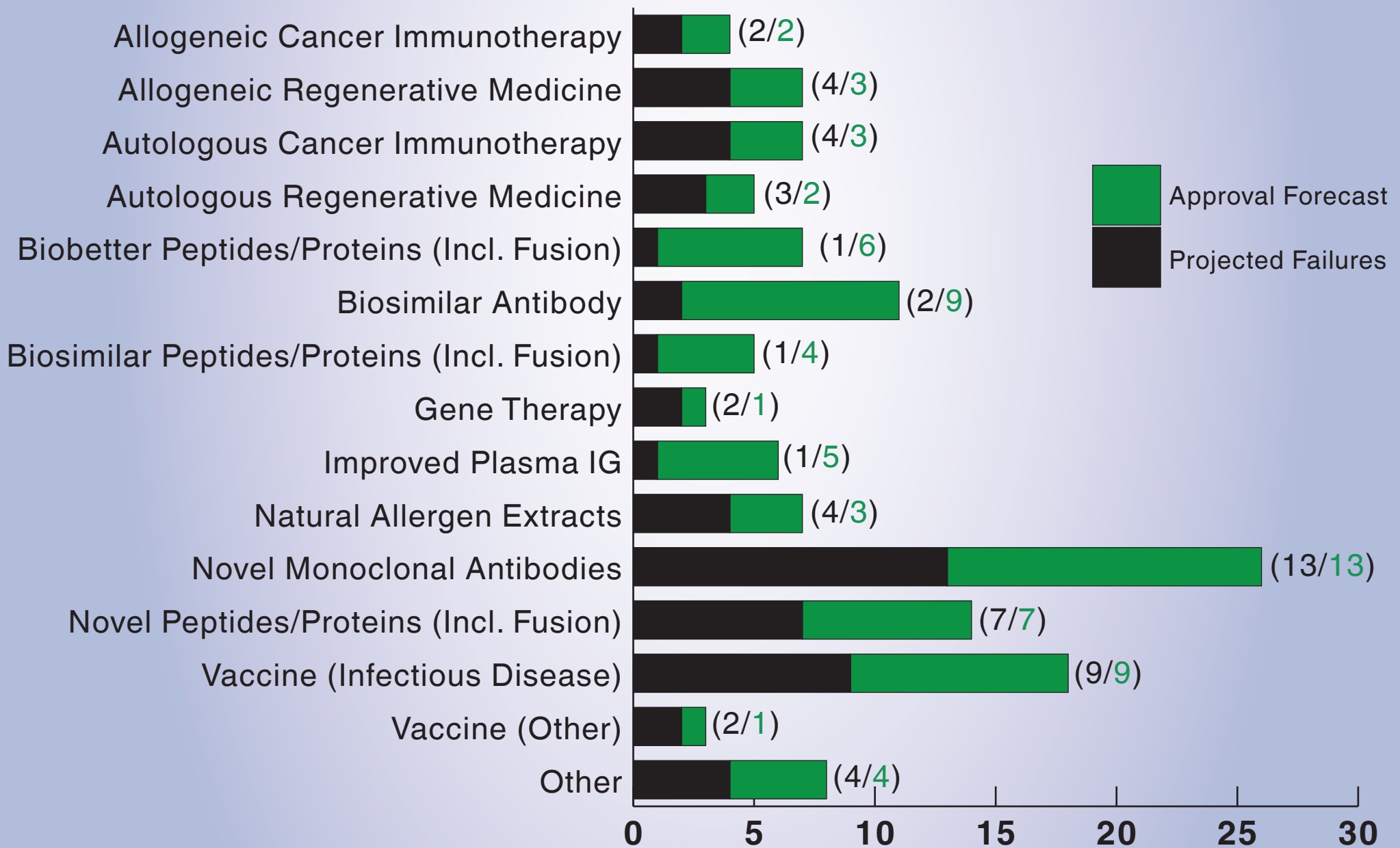
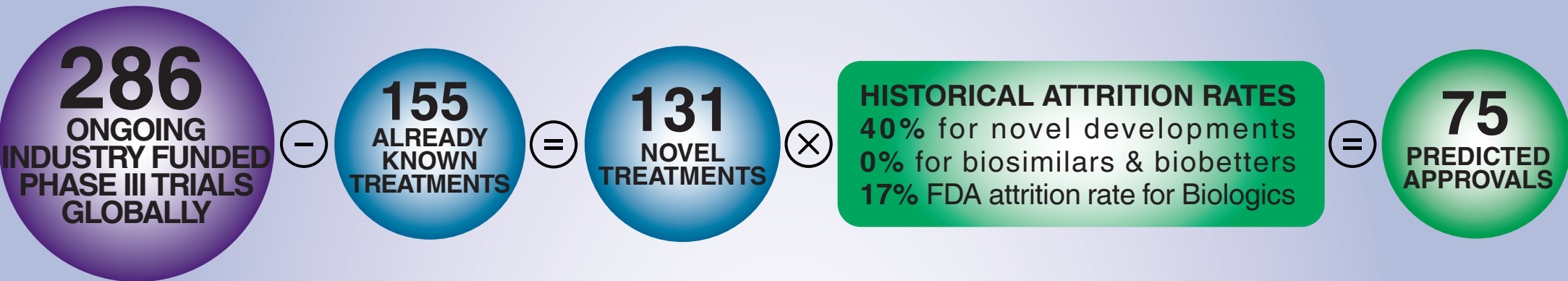


2015 BIOLOGICS APPROVALS



74%
DESIGNATED
FIRST IN
CLASS

2016-2019 PIPELINE: DIVERSIFICATION OF BIOLOGICS



BIOLOGICS BREAKDOWN: THE COMPANIES INVOLVED

VACCINES (OTHER) Astellas, Immune Response BioPharma, Novartis, Vical	NATURAL ALLERGAN EXTRACTS Abbott, BioTech Tools, Merck, Roxall Medizin, Stallergenes	OTHER BIOLOGICS Apimeds, AxoGen, Humacyte, Immunovative Therapies, Octapharma, SillaJen, Vital Therapies	BIOSIMILAR ANTIBODIES Baxalta, Celltrion, Fujifilm Kyowa Kirin Biologics, Hospira (Pfizer), mAbxience, Pfizer, Sandoz	NOVEL PEPTIDES & PROTEINS (inc. FUSION) Anhui Zhifei Longcom, Bayer, Baxalta, Bristol-Myers Squibb, Orient Europharma, CEL-SCI Corporation, CSL Behring, ImmuPharma, Jiangsu Simcere Pharma, Octapharma, Portola Pharma, Shire, Suzhou RxD Biopharma, Teva Pharma, Viventia Bio
GENE THERAPY Advantagene, GenSight Biologics, Tocagen	BIOBETTER PEPTIDES & PROTEINS (inc. FUSION) Baxalta, Biogen, CSL Behring, Pfizer, Sigma Tau Pharma, Swedish Orphan Biovitrum	VACCINES (INFECTIOUS DISEASE) Amvac, Beijing Minhai, Crucell Holland (J&J), GSK, Immunotek, Merck, Novartis, Novavax, Roche Pharma, Sanofi Pasteur, SK Chemicals		
ALLOGENEIC CANCER IMMUNOTHERAPY Bioven Europe, NewLink Genetics, Polynoma, Vaccinogen	AUTOLOGOUS CANCER IMMUNOTHERAPY AVAX Technologies, Gradalis, ImmunoCellular Therapeutics, Sotio, TC Biopharm, Tessa Therapeutics	NOVEL MONOCLONAL ANTIBODIES Ablynx, Adienne, Alder Biopharmaceuticals, AstraZeneca, Eli Lilly & Co., Gilead Sciences, GSK, Hoffmann-La Roche, Kyowa Hakko Kirin Pharma,, MacroGenics, MedImmune, Merck, Novartis, Peregrine Pharma, Pfizer,Recombio, Teva Pharma, TG Therapeutics, Ultragenyx Pharma		
BIOSIMILAR PEPTIDES & PROTEINS (inc. FUSION) Amgen, Baxalta, Bayer, rEVO Biologics, Wockhardt	ALLOGENEIC REGENERATIVE MEDICINE Mesoblast, Miltenyi Biotec, Pharmicell, Teva Pharma			
AUTOLOGOUS REGENERATIVE MEDICINE BioCardia, Celyad, Cesca Therapeutics, Cook, Histogenics				
IMPROVED PLASMA IG Ampio Pharma, Grifols Biologicals, ProMetic BioTherapeutics				

2016-2019 PIPELINE: NOTABLE PHARMA INTERESTS

NOVARTIS Novel mAbs Vaccines (Other) Vaccines (Infectious Dis.)	Baxalta Biobetter Peptides/Proteins Biosimilar Abs Biosimilar Peptides/Proteins Novel Peptides/Proteins	MERCK Natural Allergen Extracts Novel mAbs Vaccines (Infectious Dis.)	TEVA Allogeneic Regen. Med. Novel mAbs Novel Peptides/Proteins
Pfizer Biobetter Peptides/Proteins Biosimilar Abs Novel mAbs	BAYER Biosimilar Peptides/Proteins Novel Peptides/Proteins	gsk Novel mAbs Vaccines (Infectious Dis.)	octapharma Novel Peptides/Proteins Vaccines (Infectious Dis.)

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