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Weight Loss Wonders!

Yeah, Artificial Intelligence is cool and could be the mega investing trend over the next few years, BUTâ€¦you know what may be more fascinating? **GLP-1 drugs**

GLP-1 drugs have more familiar names â€“ Ozempic (approved for diabetes), Wegovy (the weight loss approved version of Ozempic), Mounjaro (treats diabetes, soon to be approved weight loss drug) â€“ and are increasingly becoming a global craze. The origin of these drugs came from a treatment of diabetes and an extension of drug companies and patients realizing that they had weight loss benefits.

Comparing Weight-Loss Drugs

	OZEMPIC	WEGOVY	MOUNJARO
AVG PERCENTAGE BODY WEIGHT LOSS*	Studies not designed to assess weight loss	Up to 17%	Up to 22.5%
APPROVED USE	Type 2 diabetes	Obesity	Type 2 diabetes
YEAR INTRODUCED IN U.S.	2017	2021	2022
MOST COMMON SIDE EFFECTS	Nausea, vomiting, diarrhea, abdominal pain	Nausea, diarrhea, vomiting, constipation	Nausea, diarrhea, decreased appetite, vomiting
GENERIC NAME	semaglutide	semaglutide	tirzepatide
MANUFACTURER	Novo Nordisk	Novo Nordisk	Eli Lilly

*Figures are from separate studies that tested different dose levels for varying durations.

Source: The companies and the New England Journal of Medicine

Table: WSJ

Hereâ€™s a great video explainer of the science behind GLP-1 drugs via WSJ (Sorry if it is paywalled).

Can you imagine the effects on our lifestyles, economy, and markets if obesity is *solved*?? The obesity epidemic costs the US about $200B per year through health-related problems, and any effort to arrest or bend the concerning trend will be met with a gigantic market opportunity. Just think of some of the 1^{st} and 2^{nd} order effects if these drugs become widespread adopted â€“ what happens to fast food companies? Companies involved in sleep apnea? Diabetes device makers? The dieting industry? A quick search of â€œGLP-1â€• mentions on public company conference shows about 1,000 mentions, and only half from pharma companies. (Fun side note: you can do similar search on â€œAIâ€• among companies and see that Kroger mentioned it numerous times. So, companies like saying â€œbuzzyâ€• things!)

[Good podcast on how these drugs could change everything]

Some interesting cocktail party talk/kids birthday party small talk/sitting in back of Uber fill the awkward silence talk/etc.:

- Novo Nordisk is the manufacturer of Ozempic and Wegovy and these drugs' recent success has led the Danish-based company to grow their market cap bigger than the country's GDP.
- Some estimates for peak annual sales of Mounjaro are up to $25B (with a â€œBâ€•!) per year. Compare that to the peak sales of Viagra that hit close to $2B/year a decade ago. This is some stiff competition!

After hearing about these GLP-1 drugs, you may be wondering about investment opportunities. Like anything related to trend investing, itâ€™s hard to (1) time it well and (2) pick the winner(s). Eli Lilly, Novo Nordisk (yay international investing!) are the two enjoying the most success now. But will the â€˜fast followersâ€™ make a splash? (see below for whoâ€™s at what stage in the obesity pharma race)

Exhibit 3: Obesity landscape in Pharma/Biotech

	Lead company	Asset	Target	Administration	Next key catalyst for the asset
Approved drugs	Novo Nordisk	Saxenda	GLP-1 receptor agonist	Subcutaneous	
	Novo Nordisk	Wegovy	GLP-1 receptor agonist	Subcutaneous	
Phase 3 and beyond assets	Eli Lilly	Tirzepatide	GLP-1/GIP receptor co-agonist	Subcutaneous	FDA decision expected by the end of 2023
	Novo Nordisk	Oral semaglutide	GLP-1 receptor agonist	Oral	US regulatory submission expected 2H23
	Novo Nordisk	CagriSema	Amylin receptor, GLP-1 receptor co-administration	Subcutaneous	Phase 3 in obesity expected completion late 2024/early 2025
	Eli Lilly	Orforglipron	GLP-1 receptor agonist	Oral	ATTAIN-2 primary completion expected June 2025
	Innovent	Mazdutide (4mg or 6mg mazdutide in Chinese patients)	GLP-1/glucagon receptor agonist	Subcutaneous	GLORY-1 trial started November 2022
	Eli Lilly	Retratrutide	GLP-1/GIP/glucagon receptor triple agonist	Subcutaneous	TRIUMPH-4 primary completion expected October 2025
Phase 2	Boehringer Ingelheim/ Zealand Pharma	Survodutide/BI 456906	GLP-1/glucagon dual receptor agonist	Subcutaneous	Initiation of phase 3 trials by Boehringer Ingelheim expected soon
	Novo Nordisk	PYY1875	PYY analogue	Subcutaneous	Phase 2 data expected 2Q23
	Pfizer	Danuglipron	GLP-1 receptor agonist	Oral	Expected phase 2 readout 2H23
	Altimmune Inc	Pemvidutide	GLP-1/glucagon dual receptor agonist	Subcutaneous	Topline results for the full 48 week trial expected in 4Q23
	Innovent	Mazdutide (9mg in Chinese subjects)	GLP-1/glucagon receptor dual agonist	Subcutaneous	Phase 2 study (Chinese subjects) 9mg mazdutide 24 week results May 10th, 2023, study will extend treatment to 48 weeks
	Amgen	AM-133	GLP-1 receptor agonist/GIP receptor antagonist	Subcutaneous	Primary completion October 2024
	Versanis (acquired by Eli Lilly)	Bimagrumab	Activin A, Activin Receptor type 2B	IV infusion	BELIEVE phase 2b study (bimagrumab+semaglutide) primary completion expected September 2025
	Carmot Therapeutics Inc.	CT388	GLP-1/GIP dual receptor agonist	Subcutaneous	Primary completion September 2023
Phase 1	Amgen	AMG-786	Unknown, "orthogonal" (SMD)	Oral	Phase 1 data expected 1H24
	Zealand Pharma	ZP8396	Amylin analog long acting	Subcutaneous	Detailed 6 week data from phase 1 MAD expected 2H23, 16 week MAD data expected 2024
	Zealand Pharma	Dapiglutide	GLP-1/GLP-2 co-agonist	Subcutaneous	Initiation of a phase 2 trial in obesity expected soon
	Eli Lilly	LY-3841136	Amylin agonist (long acting)		Phase 1 primary completion January 2024
	Eli Lilly	LY-3541105	DACRA QW II		Phase 1 primary completion October 2023
	Eli Lilly	Mazdutide	GLP-1/glucagon receptor agonist		
	Novo Nordisk	Amycretin	Amylin/GLP-1 co-agonist	Oral	Phase 1 results expected 2H23
	Novo Nordisk	GLP-1/GIP co-agonist candidate	GLP-1/GIP co-agonist	Progressing with subcut in phase 2	Novo Nordisk plans to initiate phase 2 trial (announced 1Q23 results)
	AstraZeneca	AZD6234	Long acting amylin		Phase 1 data expected 2H23
	Carmot Therapeutics Inc.	CT-996	GLP-1 receptor agonist		Primary completion expected November 2024

Source: Goldman Sachs Global Investment Research, Company data

Table: Goldman Sachs

Enjoy the weekend knowing you can eat anything you want now!

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