

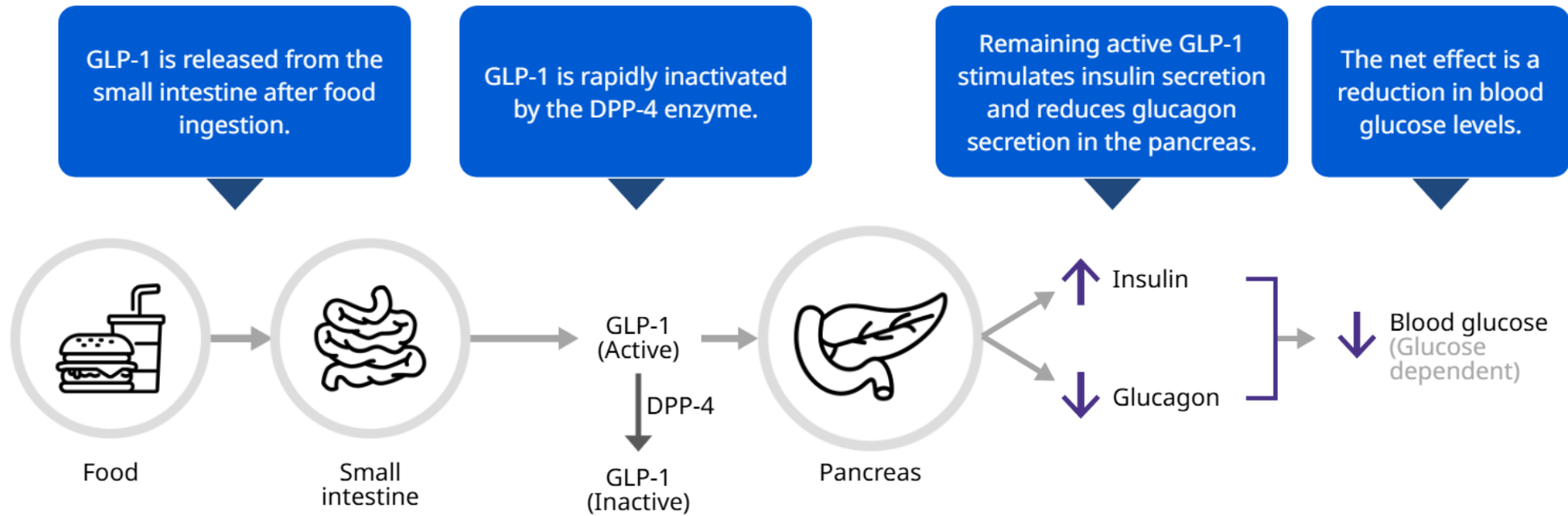
Module 2

Evaluating multifactorial benefits of GLP-1 RAs

START



Learnings from Module 1



GLP-1 - Glucagon-like peptide 1; DPP-4 - Dipeptidyl peptidase 4

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Direct Pharmacological Actions of GLP-1 RAs

Click the icons to learn more about them.



- ⬆️ β -cell function¹
- ⬇️ β -cell apoptosis¹
- ⬆️ Insulin biosynthesis¹
- ⬆️ Glucose-dependent insulin secretion¹
- ⬇️ Glucose-dependent glucagon secretion¹

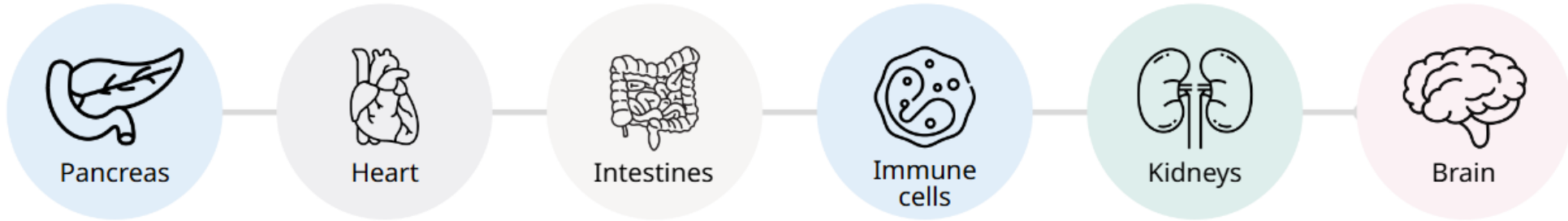


GLP-1 - Glucagon-like peptide 1; GLP-1 RA - GLP-1 receptor agonist

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Direct Pharmacological Actions of GLP-1 RAs

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- ⬇️ CV risk^{2,3}
- ⬇️ Fatty acid metabolism^{1,3}
- ⬇️ Cardiac function^{1,3}
- ⬇️ Systolic blood pressure³
- ⬇️ Inflammation^{1,4}
- ⬇️ Atherosclerotic plaque progression⁵

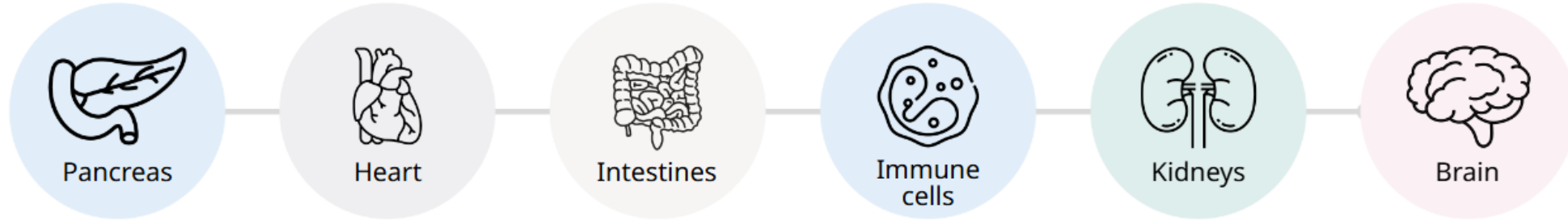


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Direct Pharmacological Actions of GLP-1 RAs

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⊕ Lipoprotein secretion^{1,6}

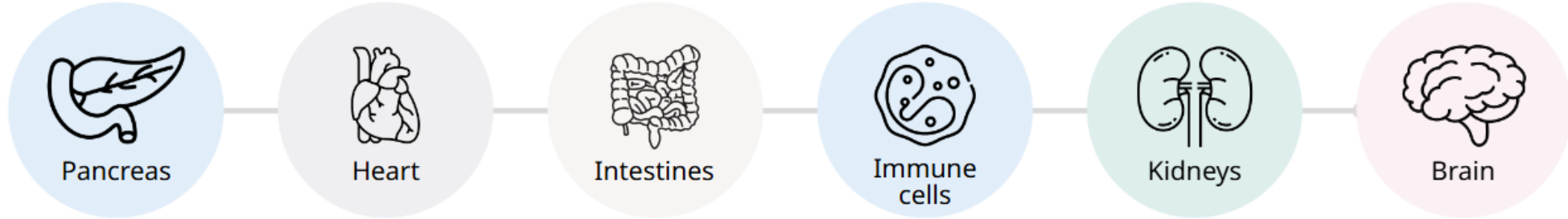


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Direct Pharmacological Actions of GLP-1 RAs

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⬇️ Inflammation^{1,7}

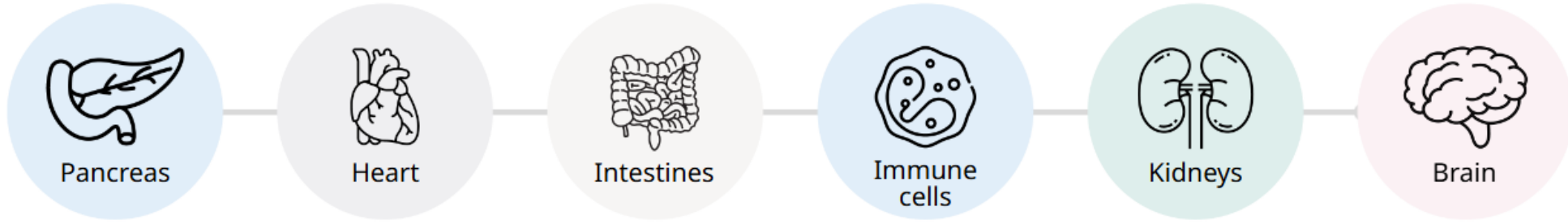


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Direct Pharmacological Actions of GLP-1 RAs

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- ⬆ Na⁺ excretion^{1,8}
- ⬆ Oxidative stress⁸
- ⬆ Inflammation⁸
- ⬆ Intraglomerular pressure⁸



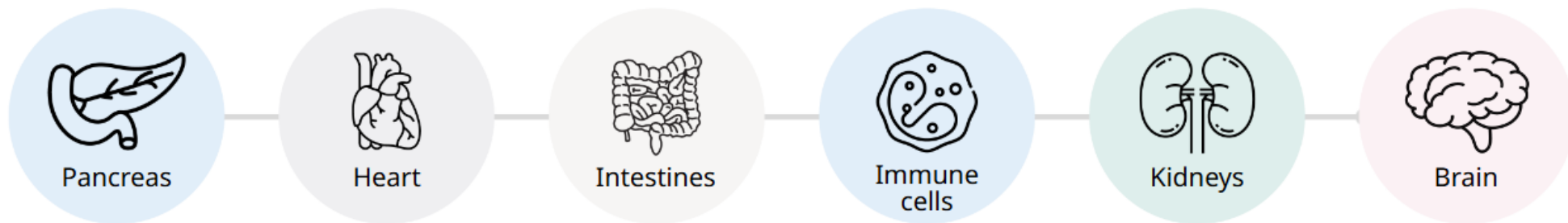
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Direct Pharmacological Actions of GLP-1 RAs

Click the icons to learn more about them.



- ⬇️ Food intake^{1,9}
- ⬇️ Body weight¹
- ⬆️ Neuroprotection^{1,9}
- ⬆️ Neurogenesis^{1,9}

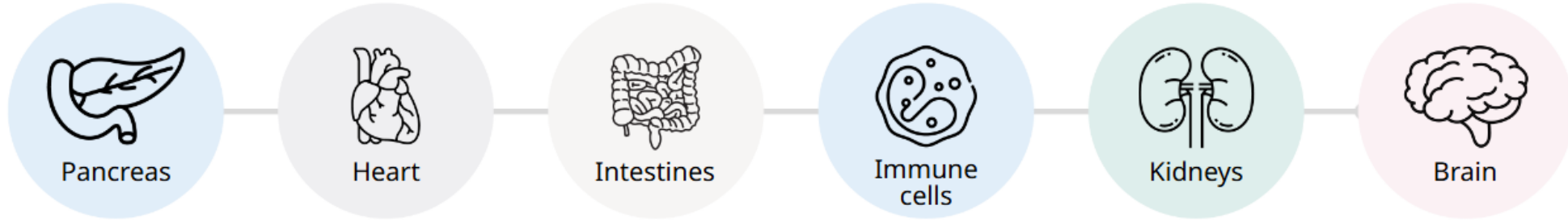


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Direct Pharmacological Actions of GLP-1 RAs

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1. Campbell JE, Drucker DJ. Cell Metab. 2013 Jun.
2. Marso SP, et al. N Engl J Med. 2016;375:311-322.
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- ⬇️ Food intake^{1,9}
- ⬇️ Body weight¹
- ⬆️ Neuroprotection^{1,9}
- ⬆️ Neurogenesis^{1,9}

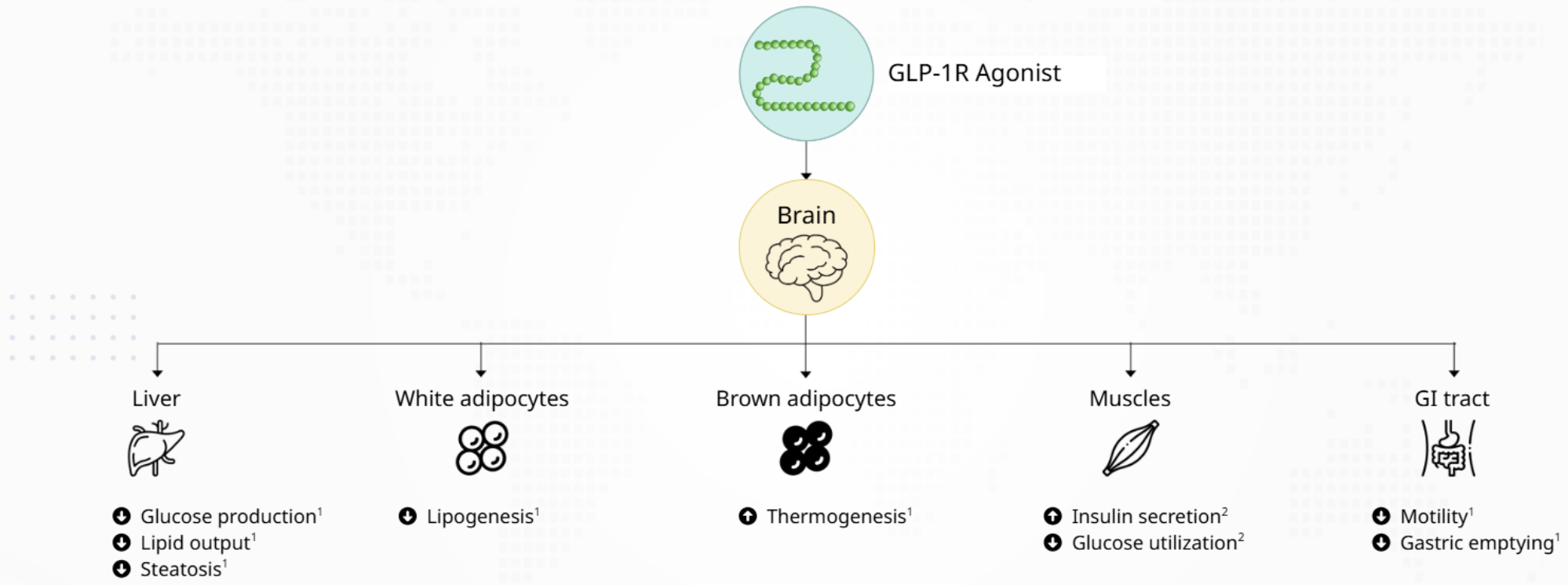


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Indirect Pharmacological Actions of GLP-1 RAs



GLP-1 RA - GLP-1 receptor agonist

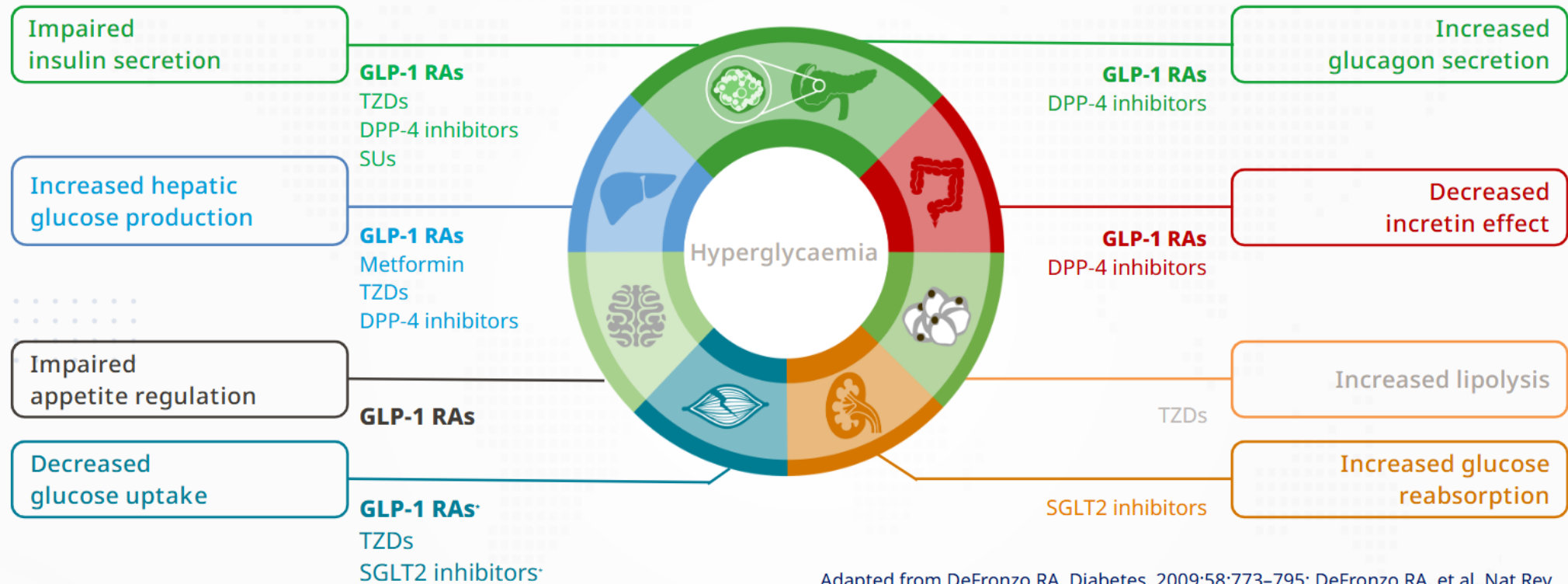
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1. Campbell JE, Drucker DJ. Cell Metab. 2013 Jun
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GLP-1 RAs address 6 out of 8 pathophysiology of type 2 diabetes



Adapted from DeFronzo RA, Diabetes. 2009;58:773–795; DeFronzo RA, et al. Nat Rev Dis Primers. 2015;1:15019;

* Indirectly, weight loss enhances both muscle and hepatic sensitivity to insulin.



DPP-4 - Dipeptidyl peptidase-4; GLP-1 RA - Glucagon-like peptide-1 receptor agonist; SGLT2 - Sodium glucose co-transporter-2; SU - Sulfonylurea; TZD - Thiazolidinedione.

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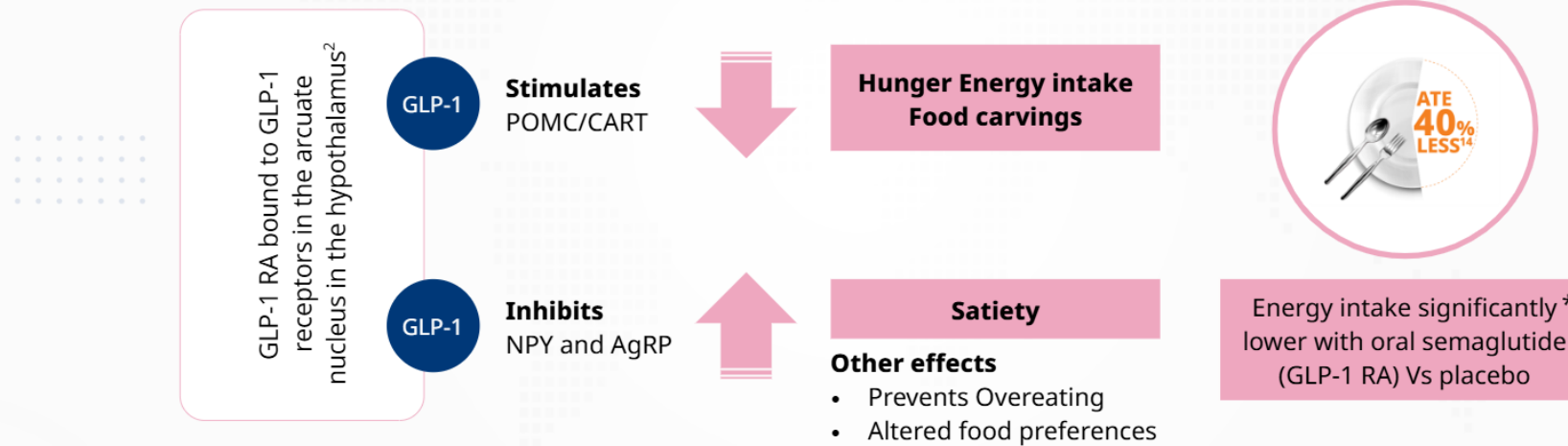
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Central action of GLP-1 RA in weight loss



Appetite regulation and weight loss¹

- GLP-1 RA directly and indirectly activates brain regions in the hypothalamus and hindbrain involved in appetite regulation
- GLP-1 RA reduces energy intake, appetite, food cravings for savoury food and body weight



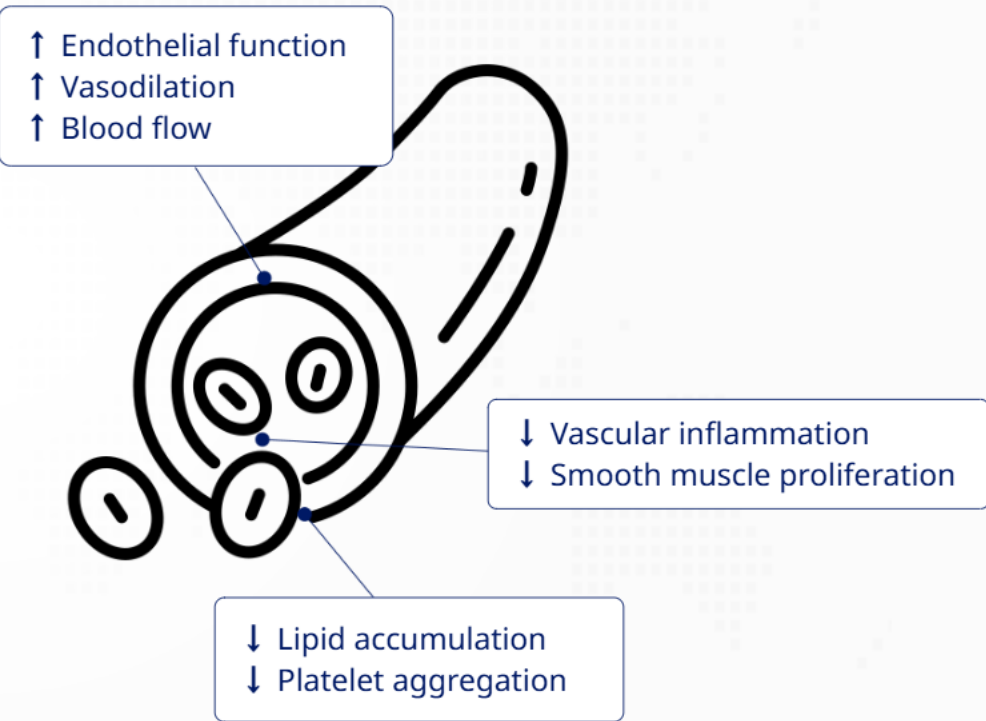
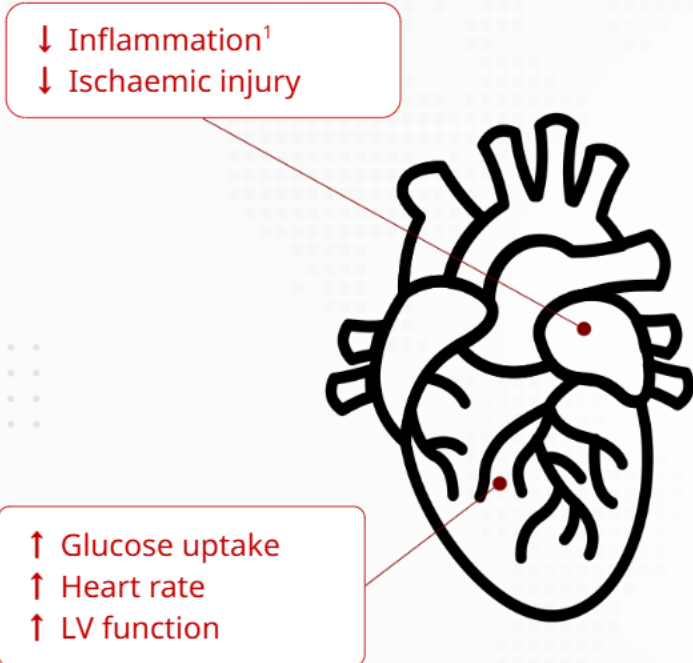
AgRP - Agouti-related peptide; CART - Cocaine- and amphetamine-regulated transcript; GLP-1 RA - Glucagon-like peptide 1 receptor agonist; NPY - Neuropeptide Y; POMC - Proopiomelanocortin

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Cardioprotective action of GLP-1 RAs



ASCVD - Atherosclerotic cardiovascular disease; eGFR - estimated glomerular filtration rate; GLP-1 RA - Glucagon-like peptide-1 receptor agonist; T2D - Type 2 diabetes
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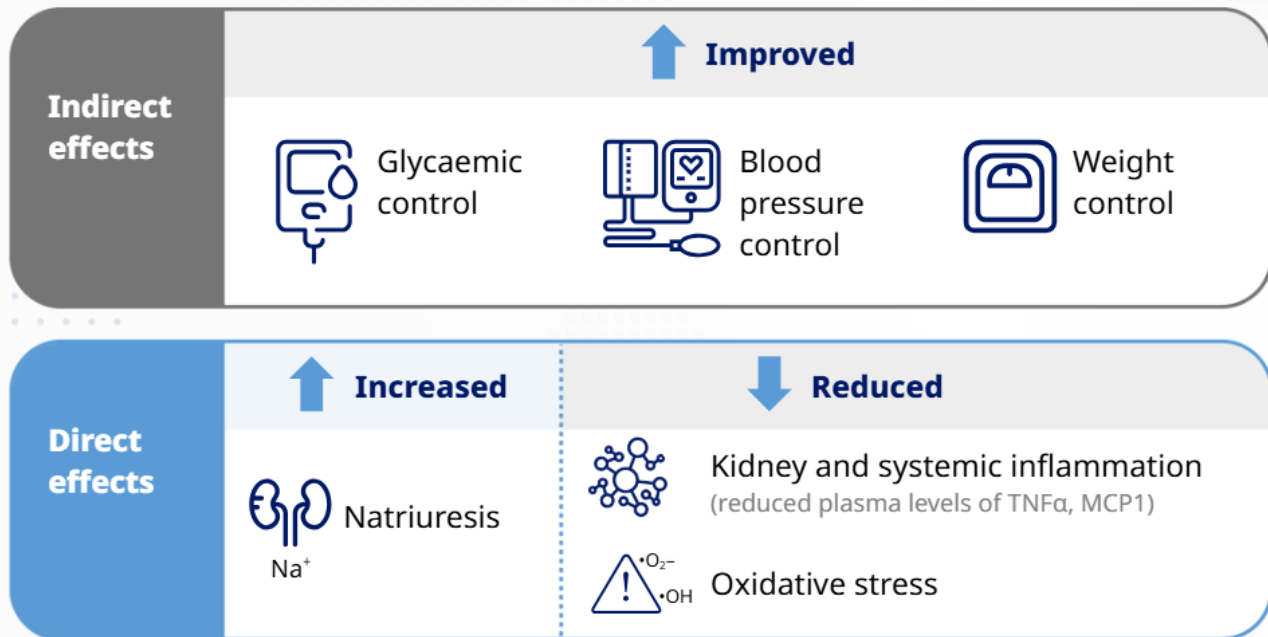


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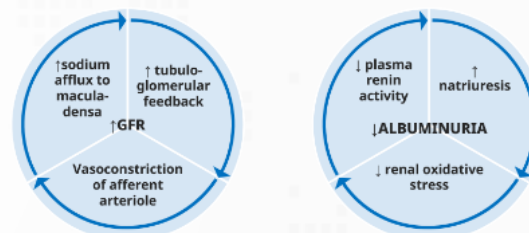
GLP-1 RAs May Exert Beneficial Nephroprotective Outcomes

Potential mechanism of action of GLP-1 RAs in kidney



Renal Hemodynamics Improvement:

Chronic administration of GLP-1R agonists decreases the annual decline in estimated glomerular filtration rate (eGFR).



Antialbuminuric Effects:

GLP-1R agonists reduce albuminuria through multiple mechanisms involved in diabetic nephropathy (DN).

GLP-1 RAs - Glucagon-like peptide 1 receptor agonists; MCP-1 - Monocyte chemoattractant protein-1; RAAS - Renin-angiotensin-aldosterone system; TNF - Tumour necrosis factor

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Key Takeaways

- GLP-1 receptor agonists mimic natural GLP-1 by binding to its receptor.
- They help manage blood sugar by promoting insulin release and enhancing insulin signaling.
- Beyond glycemic control, they offer neuroprotective, nephroprotective, anti-inflammatory, cardioprotective, and metabolic benefits.



Quiz

1 Which among the following are the potential benefits of GLP-1 RAs?

A. Weight loss by appetite regulation

B. Cardio & nephroprotection

C. Increased insulin secretion and sensitivity

D. All the above

SUBMIT



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Thank you for your attention.



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