Figure 1

Recreate Image A as a clean, publication-quality scientific infographic in English. Image A is the source figure to reproduce closely. Images B–E are the other figures from the same manuscript and are style references for consistency only. Preserve the overall layout, color palette, rounded panel design, arrow flow, dashed connector lines, icons, and conceptual structure from Image A. Keep the text accurate, sharp, and readable, including all headings, bullet points, symbols, chemical notations, superscripts/subscripts, and arrows.

Figure content to preserve from Image A: a left-to-right workflow with six main rounded panels titled "Aquaculture wastewater", "Nutrient assimilation by seaweed", "Seaweed biomass", "Polysaccharide biosynthesis", "Macromolecular architecture", and "Agricultural function". Preserve the scene/image content inside each panel and the bullets underneath each one. Preserve the bottom blue rounded panel titled "Nutrient recovery" with the subtitle "? → standardized and safe agricultural product" and the illustrations of harvested seaweed, powder, shield, and checklist. Preserve the dashed blue, red, and purple connector paths with circular question-mark markers and the callout labels "Wastewater chemistry ? → polysaccharide biosynthesis" and "Polysaccharide architecture ? → agricultural function". Maintain the same clean scientific infographic appearance, light background, and publication-ready typography. Redraw it cleanly rather than tracing, but make it very close to the source figure.

Figure 2

Recreate Image A as a clean, publication-quality scientific infographic in English. Image A is the source figure to reproduce closely. Images B–E are the other figures from the same manuscript and are style references for consistency only. Preserve the overall layout, color palette, rounded panel design, arrows, callouts, icons, and conceptual structure from Image A. Keep all text accurate, sharp, and readable, including all headings, labels, bullet points, abbreviations, symbols, superscripts/subscripts, and arrows.

Figure content to preserve from Image A: a main left-to-right workflow with the panels "Aquaculture wastewater chemistry", "Intracellular nutrient status", "Metabolic allocation node (poorly resolved)", "Polymer biosynthesis and modifications", "Macromolecular architecture", and "Functional phenotype". Preserve the top small driver panels labeled "Species / genotype", "Life stage", "Temperature", "Irradiance", and "Harvest time" with dashed arrows feeding the metabolic allocation node or biosynthesis sections. Keep the internal illustrations and the bullet lists in the blue, green, yellow, purple, and green panels on the main row, including the listed polymer examples and descriptors. Preserve the functional phenotype icons and labels "Yield", "Viscosity", "Gel strength", "Ion binding", and "Biological activity". Maintain the same clean scientific infographic appearance on a

light background, with crisp publication-ready typography. Redraw it cleanly rather than tracing, but make it very close to the source figure.

Figure 3

Recreate Image A as a clean, publication-quality scientific infographic in English. Image A is the source figure to reproduce closely. Images B–E are the other figures from the same manuscript and are style references for consistency only. Preserve the two-pathway layout, color palette, rounded panels, arrows, connector boxes, icons, and conceptual structure from Image A. Keep all text accurate, sharp, and readable, including headings, bullets, symbols, superscripts/subscripts, and arrows.

Figure content to preserve from Image A: two large header bands labeled "Pathway A: cultivation-driven biological modification" and "Pathway B: extraction-driven processing modification". Under Pathway A, preserve the panels "Aquaculture wastewater conditions", "Seaweed cultivation and metabolism", and "Native polymer architecture". Under Pathway B, preserve the panels "Post-harvest handling", "Extraction conditions", and "Processing-induced structural modification". Preserve the central dashed red callout box reading "Observed polymer difference = cultivation effect + extraction effect + their interaction" and the red warning box "Risk of misinterpretation when extraction protocols differ". Preserve the bottom blue panel titled "Measured polysaccharide phenotype" with the powder illustration, polymer illustration, and bullet list of measured traits. Keep the internal illustrations and all bullet lists as in the source. Maintain the same clean scientific infographic appearance on a light background, with publication-ready typography. Redraw it cleanly rather than tracing, but make it very close to the source figure.

Figure 4

Recreate Image A as a clean, publication-quality scientific infographic in English. Image A is the source figure to reproduce closely. Images B–E are the other figures from the same manuscript and are style references for consistency only. Preserve the three-column comparison layout, top molecular-weight banner, bottom summary band and legend, color palette, rounded panels, icons, and conceptual structure from Image A. Keep all text accurate, sharp, and readable, including headings, bullet points, polymer names, molecular-weight ranges, symbols, subscripts/superscripts, and legend labels.

Figure content to preserve from Image A: the top gradient arrow banner with "High molecular weight (10^5–10^7 Da)" on the left and "Low molecular weight / defined oligosaccharides (10^2–10^4 Da)" on the right. Preserve three main columns titled "High-MW / intact polysaccharides (alginate, carrageenan, ulvan, fucoidan, laminarin)", "Intermediate molecular weight (partially depolymerized polymers)", and "Low-MW / defined oligosaccharides (oligosaccharides, monosaccharides, sulfated fragments)". Keep each section’s subheadings, example icons, polymer drawings, and bullet lists. Preserve

the lower blue arrow note "Decreasing molecular weight" with the caption "Gradual shift from physical to biological functions". Preserve the bottom gold summary statement "Polymer size changes the dominant mode of agricultural action; structure, not polymer name alone, determines function." and the bottom legend with monomer/color keys and labels such as Mannuronic acid (M), Guluronic acid (G), Galactose, Fucose, Xylose, Rhamnose, sulfate group, glycosidic linkage, and polymer chain. Maintain the same clean scientific infographic appearance and publication-ready typography. Redraw it cleanly rather than tracing, but make it very close to the source figure.

Figure 5

Recreate Image A as a clean, publication-quality scientific infographic in English. Image A is the source figure to reproduce closely. Images B–E are the other figures from the same manuscript and are provided only as style references for consistency. Preserve the five-stage left-to-right roadmap layout, color palette, rounded panels, arrows, icons, and conceptual structure from Image A. Keep all text accurate, sharp, and readable, including headings, bullet points, abbreviations, symbols, and arrows.

Figure content to preserve from Image A: five main numbered panels labeled:

1. Wastewater characterization and seaweed cultivation
2. Biomass production and nutrient dynamics
3. Extraction, purification and polymer characterization
4. Functional validation and mechanism exploration
5. Agricultural application and sustainability assessment

Preserve the internal illustrations, bullet lists, and arrows between stages. Keep the comparison between wastewater-grown and clean-medium control biomass, the nutrient and contaminant dynamics, the extraction and characterization elements, the material and biological validation components, and the final agricultural and sustainability outcomes. Preserve the lower callout boxes relating to optimization and safety. Maintain the same clean scientific infographic appearance on a light background with publication-ready typography. Redraw it cleanly rather than tracing, but make it very close to the source figure.