

Project Title	The Acuity Consortium: Predicting and imaging drug action
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Principal Institution	Université de Sherbrooke
Summary	
<p>The low success rate (<10%) of drug candidates entering clinical phases results in substantial costs for biopharmaceutical companies, pushes up drug prices and slows down the market entry of innovative drugs. More than two-thirds of these failures are due to lack of efficacy or toxicity not anticipated in the pre-clinical phases. This high attrition rate reflects the limitations of current approaches to predicting desired and undesirable effects of drugs, and translates into high risks for Quebec SMEs in the sector. Artificial intelligence (AI) also offers enormous potential impact in the face of the complexity of the discovery process. The Acuity consortium aims to develop new AI-assisted tools to better design, detect and image the action of drugs in the preclinical stages, in order to more accurately predict the therapeutic effectiveness and adverse effects of drug candidates. Acuity will develop a continuum of technologies based on Quebec's internationally recognized expertise in AI and drug discovery.</p> <p>Acuity project will focus on four main objectives: 1) to develop and design new AI-assisted therapeutic molecules; 2) to design and produce a new generation of "biosensors" to detect <i>in situ</i> and in real time the action of drugs in order to predict their efficacy and adverse effects; 3) to develop new molecular imaging tools to visualize the distribution, metabolism and action of drugs and their targets; 4) to design new learning algorithms for drug optimization. The technologies will be developed jointly with technology development SMEs and applied by Quebec biotech or pharmaceutical companies to drug discovery projects targeting neurological, cardiovascular, metabolic and immuno-oncology diseases. Uniting Quebec's leaders in AI and drug discovery, Acuity will deliver a series of new technologies that will improve the drug discovery process and its chances of success. These technologies, applicable to all therapeutic indications, will then be made available to the Quebec and international ecosystem.</p>	