**Objectives** of the B-IMPACT project:

- to develop protective coatings for outdoor bronzes with high performance in terms of durability, while respecting the ethics of the cultural heritage,
- to investigate the toxicity of the more efficient coatings with the aim of selecting non-hazardous ones, and
- to produce a marketable pre-formulation of the most efficient coatings

**Workpackages** of the B-IMPACT project:

WP0 - Coordination
WP1 - Production of representative substrates (patination)
WP2 - Coating Development
WP3 - Protective Treatments Toxicity Assessment
WP4 - Assessment of the protectiveness and suitability of candidate treatments
WP5 - Pre-industrialisation process and validation of coating application
WP6 - Dissemination and Utilization

**Partners** of the B-IMPACT project are from universities, research institutions and industry:

- Slovenian National Building and Civil Engineering Institute, Slovenia (www.zag.si) - project coordinator
- Geida d.o.o., Slovenia (www.geida.si)
- Alma Mater Studiorum University of Bologna, Italy (www.unibo.it)
- Corrosion and Metallurgy Study Centre "Aldo Daccò", University of Ferrara, Italy (www.unife.it/centri/centro/corrosione-en)
- ECAMRICERT S.R.L., Italy (www.ecamricert.com)
- TRACES Laboratory – CNRS UMR 5608 – Toulouse University, France (traces.univ-tlse2.fr)
- PYLOTE SAS, France (www.pylote.fr)
- C2M Aurochs Industrie, France (http://c2m-aurochs-industrie.com)

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Production of representative substrates - patination:
Simulation of two different situations for outdoor monuments:
- (1) Modern silicon bronze (CuSi), currently used by artistic foundries for contemporary art, finished by brown patina. Samples will be supplied in the artificially patinated condition.
- (2) Historical quaternary bronze (CuSnZnPb), covered by natural outdoor patinas. Samples will be patinated by accelerated ageing tests.

Coating Development:
- (1) Fluoropolymers coatings with outdoor durability, chemical resistance and good flexibility.
- (2) Silane coatings with protectiveness towards patinated bronze. Their long term efficiency will be improved by addition of hybrid particles.
- (3) Multi-layer coatings, consisting of different layers of oppositely charged nontoxic polyelectrolytes, applied by a modified Layer by Layer (LbL) method.
- (4) Spray sol-gel coatings for patinated bronze for easy application.

Assessment of the protectiveness and suitability of candidate treatments:
- The most effective protective treatments will be applied to patinated and characterized bronzes.
- The assessment of the protectiveness of the selected treatments will be performed through accelerated artificial ageing tests.

Ljubljana city centre, Prešeren monument: Farewell of Črtomir and Bogomila from Baptism at the Savica (detail). Bogomila cries in the arms of the hero Črtomir.

Pre-industrialisation process and validation of coating application:
- preparation of coating at a preindustrial level;
- validation of the applicability onto outdoor bronze monuments;
- simple market testing and economic evaluation of the product;