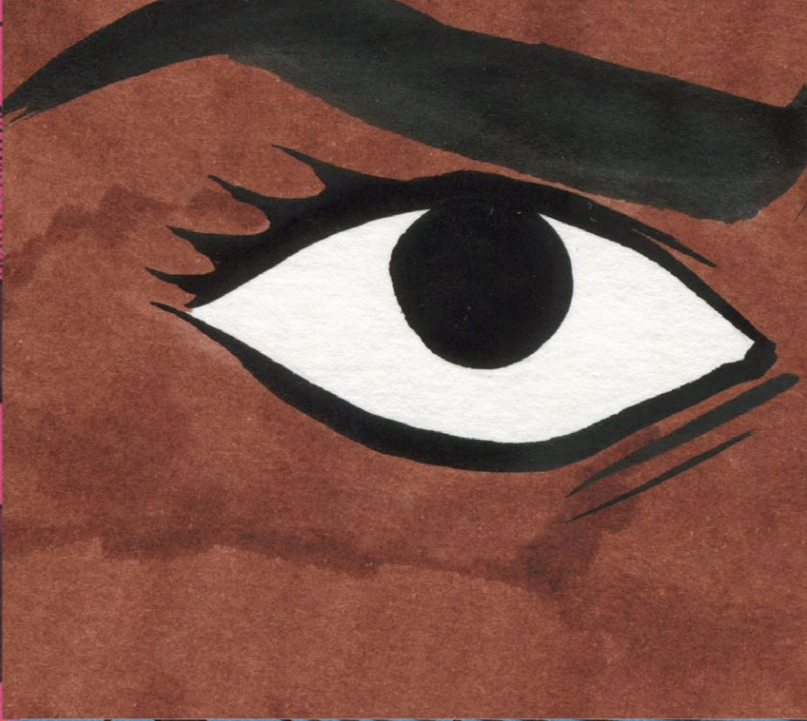
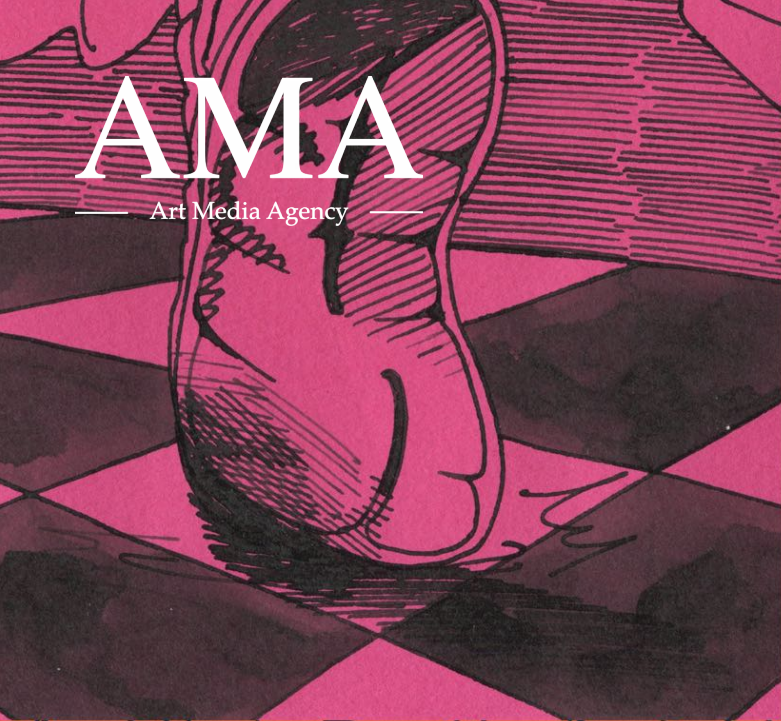


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DIVING INTO GREEN CLEANING AT TATE

Associated with the GREENART project, the Tate overlooks discussions and collaborations around the assessment of the green cleaning products that are being elaborated. The team's director Bronwyn Ormsby sheds a brighter light on its role and objectives.

Acting as Principal Conservation Scientist at Tate — a position she has been holding since her nomination in 2016 —, Bronwyn Ormsby graduated with a PhD in Heritage Science from Northumbria University in Newcastle in 2002. This is where her collaboration with the institution initially started. Since, she has worked in various roles in Conservation Science and today leads and manages the Conservation Science and Preventive Conservation teams. She also supervises PhD students, oversees and devises scientific research, while providing scientific support for the Conservation Department. Hence her important position within the GREENART project, where she is responsible for Tate's project design, content, and delivery with a team comprising Conservation Science, Paintings Conservation, as well as support from the Collection Care, Curatorial and Research and Interpretation. She further reveals what her role and Tate's are about.

What is your role in the GREENART project?

Tate is an Associate Partner in the GREENART project. Our involvement is funded by UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant. We were partner in another EU-funded project, NANORESTART, from 2015 to 2018 so I was familiar with the inter-university research consortium (CSGI). As the Principal Investigator for Tate's contribution to GREENART, I designed Tate's project accordingly. Research is primary to Tate's mission and every proposal must be accepted by a range of internal and external stakeholders. The project must be aligned with institutional values, relevant to the Collection and needs to address urgent research and/or

practice-based questions. We have a substantial body of research into modern painted works of art and cleaning science to draw from, as well as ongoing programmes around sustainability, so we were well-placed to join GREENART. Tate is the leader for Work Package 2 (WP2) Task 2.3: we co-ordinate discussion and facilitate collaboration around the assessment of the green cleaning materials produced as part of WP2. We meet monthly on Zoom to discuss a range of topics from ethics to the new GREENART materials and beyond. This role is particularly important as well as being enjoyable, where we meet with colleagues from across the globe on a regular basis to learn from each other's experience and research.

In simple words, can you tell us what is involved in cleaning a work of art?

What is removed?

Cleaning a work of art is never simple, it depends on the context of the situation, on what you are trying to remove, or how materially complex the work of art is. And it also depends on the time and resources available. One key task is to determine whether

something is unwanted and why. Sometimes it is a dirt layer, a coating — or both —, or a retouching. It can also be a graffiti, a range of accidental marks... On occasion it can be the artwork materials themselves degrading and forming obscuring layers on the surface. Once the primary query has been explored, the next step is to assess any risks that might be associated with the cleaning processes. This involves exploring the artwork materials as well as the possible cleaning systems that you may want to use in depth, which leads to consideration of the benefits and risks of each option. When this has been completed (with a whole lot of accompanying due diligence and documentation) the cleaning process, usually slow and meticulous, may then proceed with caution and a regular assessment of progress. Sometimes, however, it may still be advantageous to choose not to clean as we may not know enough about the materials involved, or the artwork may be simply too fragile. Equally, choosing not to clean may bring its own risks, such as the embedding of soiling layers, which generally become harder to remove with time.

What exactly is an assessment of a green cleaning fluid?

GREENART aims to produce cleaning materials that are “green” — i.e., they should have low environmental and human impact — in the form of various gels and liquids called microemulsions or nano-structured fluids. Before they can be used on works of art, they need assessment across a range of parameters. All the GREENART WP2 materials involve direct application to works of art; hence they need to be risk-benefit assessed with diligence regarding their impact on the materials to be removed as well as the works of art.

Assessments involve characterising the cleaning system properties such as porosity, stiffness, and liquid retention/release capacity which is conducted by the work package leaders (CSGI) at the pre-production stage. Once the materials are with the heritage partners, other types of assessment also become relevant, including how the materials handle, their cleaning efficacy, ease of use, capacity for re-use, adaptability to various conservation challenges, potential for cleaning system residues remaining on artwork surfaces, safety and disposal protocols, amongst others. This is conducted through collaboration between the material manufacturers, conservation/heritage scientists and conservators and is often focused on case study works of art that have been noted as requiring conservation treatment. Assessment tools range from the unaided human eye to multi-light-wavelength imaging and photography, increasingly sophisticated microscopy, as well as a range of scientific assessments from the macro to the sub-micron level and beyond. The tools used will vary with the cleaning material type, the artwork materials, shape and size, the availability of instrumentation and expertise, as well as people and financial resources. One of the benefits of working within a large collaboration such as GREENART is that we can approach others within the consortium to discuss, offer and share ideas and skills, as well as the results of these assessments across a range of works of art, from ancient stone to contemporary art.

Is it a methodology that can be adapted to all cultural property materials?

There are established and modified conservation research and examination methodologies

that have been used for these types of assessments for decades which can be used for most materials-based works of art (and can also be improved along the way). Most start off with exploring the cleaning materials and artworks separately, followed by an assessment of the effects of the cleaning systems applied to what we call mock-ups, or if super lucky, using some archival material sourced through the artist/ other colleagues/institutions which is close if not identical to the artwork in composition and age, such as a preparatory piece. These types of materials are hugely valuable and hard to come by. This process, particularly when research time is funded well, leads to the narrowing down of options and the lowering of inherent risk as the need to test options on the work of art is reduced. The use of mock-ups also facilitates the development of knowledge about how these novel materials handle, behave and can be optimised to the specific cleaning challenge.

Will you also assess the eco-sustainability of the novel material?

Tate will not be assessing the eco-sustainability of any of these materials directly, though we will be exploring the constituents carefully and looking to the life cycle assessments conducted in WP8 with keen interest!

Are you also planning to make a comparative analysis with more traditional methods?

Yes, we always include comparative studies within our cleaning research as it offers better quality and less biased information to the wider field and adds necessary rigour to our risk assessment process. We never guarantee to use novel systems on Tate works — we always



D^r Morana Novak and D^r Angelica Bartoletti
carrying out X-Ray Fluorescence (XRF) analysis
of Bridget Riley's *Fall* to help identify the pigments present

Photo D^r Bronwyn Ormsby. Courtesy Tate. © The Bridget Riley 2020

devise, rigorously assess, and choose the best option for the work of art in question whether it is a novel system, or not. We will at the very least be using several similar materials, including established systems such as agar that have been used in conservation for at least two decades as well as the NANORESTART materials which we now have considerable experience in using. Our exact mix of materials has yet to be finalised it is one of the several questions we are currently thinking through.

How does a new product make its way from the research laboratory to the restoration studios?

It depends. With GREENART, this process is embedded within the project and is relatively formalised through technology readiness level outputs (TRL). Outside of multi-year funded research, this is done on a smaller scale through focused collaborations between industry/academia and heritage professionals or by heritage professionals themselves with a specific problem to resolve. In GREENART, as the heritage partners move into the assessment phase using rigorous methodologies and carrying out case study treatments, particular products will begin to rise above others as being most suited. This in turn will mean that the preferred options will receive further finessing and development. The products that meet all the required criteria and show promise across a range of conservation cleaning challenges are most likely to be included in a commercial production phase towards the end of the project.

Which other institutions are involved in this validation process?

In WP2 the team at Tate works with conservation and scientific colleagues from a range of institutions and private practice in addition to our CSGI colleagues to contribute to the assessment and modification of the WP2 novel cleaning materials. This includes the University of West Attica (UNIWA, Greece); Ministero Della Cultura Italian Cultural Ministry (MIC, Italy); The Solomon R. Guggenheim Foundation (Peggy Guggenheim Collection Venice, Italy and New York, USA), Antonio Mirabile (France and Brazil), Los Angeles County Museum of Art (LACMA, USA), the Hungarian National Museum, (HNM, Hungary); the Metropolitan Museum of Art, New York, USA; Tokyo University of Science, Japan; the University of Ljubljana, Slovenia; and the Museum of Fine Arts Houston (MFAH, USA).

Which works from Tate's collection do you intend to clean?

Tate is delighted that our case study research and conservation treatments will focus on two important paintings by renowned British artist Bridget Riley (b. 1931) dating from the early to mid-1960s, called *Hesitate* (1964) and *Fall* (1963). These paintings have delicate, unvarnished polyvinyl acetate (PVAc) based painted surfaces, with accumulated soiling and marks which can detract from the impact of these ever-popular works of art. This paint type has had relatively little attention and is widely represented in Tate's collection. These paintings will benefit enormously from the careful, rigorous, and diligent practice-based research afforded through the GREENART project to underpin decision-making and treatment design to deliver optimal, appropriate outcomes. For these artworks, the primary risks include working with inherently water-sensitive paints and burnishing the surface from even the lightest applied pressure, which could result in unacceptable, permanent change. We are currently carrying out further in-depth examination and analysis of the paintings, exploring Bridget Riley's working processes, making mock-ups based on the painting materials and structures while researching into PVAc paints. Soon, we will start trialling comparative treatment options on these mock-ups. As we acquire knowledge over the course of the research, if any of the GREENART materials prove able to afford low-risk, appropriate and sustainable cleaning outcomes the conservation treatment of *Hesitate* will proceed first, followed by *Fall*. This will be supported by a full evaluation of the treatments themselves as well as research into GREENART cleaning system residues and the characterisation of any impact of their use on PVAc paints which we also hope will be of use to heritage professionals globally.



D' Morana Novak carrying out colour measurement, on soiling materials used for mock-ups of Bridget Riley's *Hesitate*

Photo Tate Photography, Courtesy Tate Gallery





D^r Bronwyn Ormsby, Katey Twitchett-Young, Anna Cooper
and D^r Morana Novak in front of Bridget Riley's *Hesitate*

Photo Annette King. © Tate



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