Blueprint Biosecurity

Request for Proposals

Safety Assessment for Far-UVC Exposure (SAFE-UVC)
July 27, 2026

Overview

Far-UVC light (200-235 nm) is among the most promising emerging technologies for reducing airborne disease transmission in occupied indoor spaces. Unlike conventional germicidal UV (typically ~254 nm), far-UVC inactivates many airborne pathogens but is strongly absorbed by the outermost, non-living layers of skin and the eye's surface, so it does not reach the dividing cells underneath.

This absorption profile is reflected in the exposure limits recommended for far-UVC. Expert bodies have recommended limits for far-UVC since the 1970s. These include occupational Threshold Limit Values (TLVs) from the American Conference of Governmental Industrial Hygienists (ACGIH), updated in 2022, and guidance from the International Commission on Non-Ionizing Radiation Protection (ICNIRP). Far-UVC is deployed today within these recommended limits, which in some cases have already been incorporated into product standards.

However, as far-UVC moves toward wider deployment, an expanded safety evidence base is needed to support its endorsement by standards bodies and public health institutions and to bring these different expert bodies into full alignment on exposure limits and how they should be implemented in practice. This Request for Proposals (RFP) identifies 10 technical areas addressing key remaining safety questions across three domains:

1) Improved general characterization of far-UVC exposure
2) Eye-specific exposure safety
3) Skin-specific exposure safety

The aim of this RFP is to generate the empirical evidence needed to resolve these questions and provide a basis for potential institutional endorsement for wider far-UVC deployment.

Opportunity

We invite *Expressions of Interest* from groups to investigate the following areas:

- **Improved General Characterization of Far-UVC Exposure:** multi-year human exposure, biomarkers of alternative damage mechanisms, and real-world dosimetry of far-UVC to human tissue
- **Eye-Specific Exposure Safety:** conjunctival effects, mechanisms of eye irritation, and dry eye and ocular surface disease impacts
- **Skin-Specific Exposure Safety:** age-related variation, skin type and melanin effects, photosensitizing medications, and wound and disrupted-skin exposure

We welcome submissions from teams with expertise in photobiology, ophthalmology, dermatology, occupational health, photochemistry, dosimetry, indoor air quality, and related fields, regardless of their level of prior experience with far-UVC. For teams with no prior experience with far-UVC, we will make reasonable efforts to arrange expert support for the work if selected for an award. Please reach out to safe-uvc@blueprintbiosecurity.org if you have questions about far-UVC or study requirements; we are happy to help.

Anticipated awards

We have included expected proposal values for each technical area. These guidelines represent our best estimate for the maximum amount that a study answering the key questions might cost if run efficiently.

Depending on proposal quality, cost-effectiveness, and available funding, we may not make an award for every technical area, or we may make multiple awards in some technical areas. Awards are anticipated to range from $500,000 to $2,000,000 per technical area.

We particularly value speed of execution, and we prefer proposals that reasonably aim to achieve their stated deliverables within 24 months or sooner. We recognize that the multi-year human exposure study (Technical Area 1) is an exception to this timeline; longer timelines are expected and encouraged for this study.

Important dates

Posting date: July 27, 2026

Deadlines for *Expressions of Interest*:

- Group 1: Improved General Characterization of Far-UVC (Technical Areas 1-3): **August 28, 2026**
- Group 2: Eye Safety (Technical Areas 4-6): **September 18, 2026**
- Group 3: Skin Safety (Technical Areas 7-10): **October 9, 2026**

Expressions of Interest will be evaluated on a rolling basis. Selected groups will then be invited to submit a *Full Proposal* within 3 weeks of receiving a Notice of Recommendation.

Submission instructions

Please email submissions to safe-uvc@blueprintbiosecurity.org**.**

Submissions are **strongly encouraged**, but not required, to use the *Expression of Interest* template that will be made available alongside this RFP. We care more about clarity of plan than perfect formatting or polish.

Contact information

Technical POC: Kelsey Quinn, Far-UVC Program Officer, Blueprint Biosecurity

RFP Email: safe-uvc@blueprintbiosecurity.org

Background

About far-UVC and the current state of safety evidence

Far-UVC refers to ultraviolet light in the 200-235 nm range, most commonly delivered as 222 nm light from filtered krypton chloride (KrCl*) excimer lamps. Unlike conventional germicidal UV (typically 254 nm), which has been used in high-risk settings for decades, far-UVC's shorter wavelength is strongly absorbed by peptide bonds in proteins. In human tissue, this means the light is mostly absorbed in the outermost, non-living layers of the skin and eyes before it can reach the living, dividing cells below. In airborne microbes, the same absorption damages proteins as well as nucleic acids. Thus, far-UVC can inactivate pathogens through two pathways rather than the single genomic mechanism on which conventional germicidal UV relies.

Far-UVC deployment is subject to human UV exposure limits that have existed for decades. These limits were aligned across two influential bodies – ACGIH and ICNIRP – and were based on corneal and skin injury data from the 1970s, with a single limit of 23 mJ/cm^2 applied to both skin and eyes for 222 nm. In the United States, OSHA has no permissible exposure limits for germicidal UV, making the ACGIH limits the de facto standard. In its 2022 update, ACGIH raised the 222 nm limits substantially and, for the first time, set separate values for the eye (161 mJ/cm^2) and skin (479 mJ/cm^2). ICNIRP's limits have not been revised since 2004 and remain at 23 mJ/cm^2 for both skin and eyes, resulting in divergent guidance. These limits set the allowable dose for human exposure in real-world settings, which in turn determines the amount of pathogen inactivation that far-UVC can deliver in a given space. Precisely where these limits are drawn directly shapes the balance between safety and efficacy. Further clarifying the safety profile, particularly in real-world environments that take human behavior and anatomy into account, may help resolve this complexity and enable more informed development and deployment of far-UVC.

The safety evidence accumulated to date is encouraging but likely insufficient to satisfy the standards bodies and public health institutions whose endorsement is needed for wider deployment of far-UVC. Existing research has primarily examined exposure over shorter time horizons, included only a small fraction of the population that wider deployment would expose, and been conducted under controlled conditions rather than in real-world settings. Exemplary studies include:

- In Eadie et al. (2021), the skin of a single volunteer was exposed to far-UVC at doses up to 38× the pre-2022 ACGIH 8-hour limit without producing erythema.
- In Yamano et al. (2020), hairless mice, including Xpa-knockout mice modeling Xeroderma Pigmentosum (a genetic disorder causing UV sensitivity and skin cancer susceptibility), were exposed to 222 nm far-UVC for 8 hours a day, 5 days a week, for 66 weeks and showed no signs of skin cancer or skin abnormalities.
- Sugihara et al. (2024) followed four physicians working in a far-UVC-equipped ophthalmic examination room for 36 months and found no significant changes in visual acuity, refractive error, corneal endothelial cell density, or signs of pterygium, keratopathies, or cataracts.
- Kousha et al. (2024) found no eye discomfort from far-UVC exposure in a simulated office environment using validated SPEED and OSDI questionnaires.

- Christou et al. (2025) tested 83 individuals with photosensitivity disorders — including 46 with confirmed heightened sensitivity to other UV wavelengths, some up to 120× more sensitive than healthy volunteers — and found no visible skin changes at the ICNIRP exposure limit.
- Comprehensive reviews of far-UVC safety, along with recommendations for further study, can be found in Görlitz et al. (2024) and Blueprint's own Blueprint for Far-UVC.

Taken together, these studies have not identified significant evidence of harm from far-UVC exposure under the conditions tested thus far. Gaps remain, however, regarding the safety profile of far-UVC exposure that widespread deployment would create for the general public, including potentially vulnerable populations. To this end, this RFP is structured around addressing the following critical gaps:

- **Improved General Characterization of Far-UVC Exposure:** multi-year human exposure, biomarkers of alternative damage mechanisms, and real-world dosimetry of far-UVC to human tissue
- **Eye-Specific Exposure Safety:** conjunctival effects, mechanisms of eye irritation, and dry eye and ocular surface disease impacts
- **Skin-Specific Exposure Safety:** age-related variation, skin type and melanin effects, photosensitizing medications, and wound and disrupted-skin exposure

Improved General Characterization of Far-UVC Exposure

Technical Area 1: Multi-year human exposure study

The strongest evidence for far-UVC safety comes from acute and short-duration studies. Long-term data is limited: Yamano et al. (2020) provides 66 weeks of chronic animal exposure with no observed harm, and Sugihara et al. (2024) extends to 36 months of human observation but with only four participants, doses constrained to the pre-2022 ACGIH limit (23 mJ/cm² over 8 h), and a single clinical setting. Given that far-UVC is proposed for daily use over extended durations, the absence of chronic human exposure data at scale, at post-2022 ACGIH limits, and across a broader endpoint panel is a significant remaining gap for regulatory bodies, policymakers, and the broader public. A long-duration safety study would provide the strong evidentiary foundation necessary for regular, multi-year use in occupied spaces.

As this study may take years to generate meaningful results, starting it as soon as possible is critical. Notably, this study could take place in parallel with a far-UVC pilot installation, be embedded within any ongoing far-UVC research study, or be co-located with another ongoing far-UVC installation. Proposers are encouraged to consider these structures.

Key questions

- Does the far-UVC safety profile observed in short-duration human studies hold under multi-year near-continuous exposure at near-limit fluence rates?
- Are there cumulative effects on the eye or skin that emerge only with chronic exposure?

- Which clinically-relevant biomarkers or symptoms, if any, develop or progress over months to years of continuous far-UVC exposure?
- Does long-term exposure differentially affect any tissue or cell type (e.g., goblet cells, ocular surface, basal epidermis) more than would be predicted from short-duration studies?
- How do any observed effects evolve after exposure ceases (reversibility, follow-up trajectory)?

Proposal guidelines

Competitive proposals will include some or all of the following:

- Identify one or more high-occupancy settings suitable for multi-year deployment of far-UVC at near-limit fluence rates within ACGIH or ICNIRP guidelines.
- Specify protocols for periodic skin and eye evaluations, including ophthalmologic and dermatologic assessments and a defined biomarker panel.
- Specify the participant surveying approach, including symptom tracking, quality-of-life measures, and intercurrent illness reporting.
- Include post-exposure follow-up assessments at defined intervals.
- Justify sample size and statistical power, and identify primary and secondary endpoints suitable for interim analyses.
- Describe protocols for tracking individual cumulative dose (dosimetry approach) over the study duration.
- Specify a plan for efficient ethics review (e.g., application to university or commercial institutional review boards).
- Where feasible, specify a plan to embed the study within a larger ongoing far-UVC study, such as a randomized controlled trial or pilot installation, where doing so could accelerate enrollment, share infrastructure, or strengthen the study design.

Expected funds available (for entire technical area): Up to $2,000,000

Technical Area 2: Standardizing biomarkers of acute biological effects

Current safety testing tends to look at the best-understood form of UV damage, but far-UVC light could affect cells in other ways that have received less attention. Most UV safety assessment has focused on DNA damage via the generation of cyclobutane pyrimidine dimers (CPDs) and 6-4 photoproducts. As far-UVC is strongly absorbed by peptide bonds in proteins, it has been proposed that this interaction may produce types of cellular damage that are not captured in current testing. Potential biological effects – including oxidative stress, double-strand DNA breaks, lipid peroxidation, and protein oxidation – have been less thoroughly characterized in the current far-UVC literature. A study of a broader biomarker panel that includes these targets would provide a more complete picture of the safety of far-UVC exposure.

Key questions

- Beyond CPDs and 6-4 photoproducts, what biomarkers of cellular damage are induced by far-UVC at deployment-relevant doses and dose rates?

- What is the dose-response curve for each marker, and does it differ from CPD/6-4 photoproduct dose-response?
- How do these damage profiles compare to longer-wavelength UV (e.g., 254 nm, broadband UVB) dose-response curves?
- What is the potential clinical relevance of other forms of far-UVC-induced damage at deployment-relevant doses?
- Do alternative damage pathways have particular relevance to specific ocular cell populations – corneal epithelium, conjunctival epithelium, goblet cells – with different turnover rates and absorbance profiles?

Proposal guidelines

Competitive proposals will include some or all of the following:

- Prioritize relevant human cell or tissue models appropriate to the biomarkers being investigated. Proposers should justify their choice of model.
- Test a range of doses and dose rates that span subthreshold exposures through and above current regulatory limits, where possible.
- Include appropriate controls, including sham exposure and longer-wavelength UV comparators where relevant.
- Measure a broad panel of biomarkers, including but not limited to: oxidative stress markers, double-strand DNA breaks (e.g., γH2AX), protein oxidation, lipid peroxidation, and apoptosis/cell death indicators.
- Justify which biomarkers are most relevant to far-UVC's mechanism of action and why.
- Include a plan (and rough additional budget estimate) for follow-up in an appropriate animal model or human exposure study if mechanism findings warrant it. Such follow-up may require additional funding beyond this RFP.

Expected funds available (for entire technical area): Up to $500,000

Technical Area 3: Real-world dosimetry of far-UVC exposure to human tissue

Current far-UVC installation standards (UL 8802, ANSI/IES RP 27.1-22) assess compliance as if a person stands at the worst possible position in a room, staring directly at the light source, for eight continuous hours. Though the underlying ANSI standard recommends time-weighted averaging to account for actual occupant behavior, current installation safety assessments do not yet incorporate time-weighted averaging, resulting in a compliance framework that is likely more conservative than the underlying guidance intended (Welch et al. 2025). In practice, real-world exposure is likely much lower: people move through rooms; sit, stand, and spend time in different locations; and receive additional eye shielding from anatomical features such as eyebrows, eyelashes, and blinking. A manikin study (Duncan et al., 2023) found that only ~5.8% of the maximum dose recorded on the manikin's head, nose, and lip actually reached the eye surface from ceiling-mounted fixtures – and that manikin had no eyelids, eyelashes, or eyebrows to further attenuate ocular-surface exposure.

If new safety research identifies a concern at a particular tissue exposure level, the practical impact depends entirely on how that tissue-level finding translates into real-world installation requirements. Comprehensive dosimetry studies across realistic deployment scenarios would simultaneously increase safety confidence and establish the empirical basis for updating installation standards to reflect actual human behavior rather than theoretical worst cases. We welcome creative and innovative proposals to better quantify the dose in real-world installation scenarios.

Key questions

- What fraction of ceiling-mounted far-UVC actually reaches the eye, skin, and other tissues of human occupants in realistic occupied environments?
- How does this fraction vary across room geometries, fixture configurations, occupancy patterns, occupant populations, and occupant behaviors (e.g., hospital patients, hospital workers, office workers, schoolchildren, and restaurant patrons)?
- Do existing computational dosimetry models adequately predict measured exposure in real installations? Where do they diverge and why?
- How should tissue-level safety findings translate into installation requirements that are both protective and practical?
- What standardized dosimetry test methods, occupant-behavior assumptions, and time-weighting frameworks might be incorporated into product safety standards (e.g., UL 8802) installation standards (e.g., ANSI/IES RP 27.1-22)?

Proposal guidelines

Competitive proposals will include some or all of the following:

- Human-subject dosimetry, or dosimetry using an appropriate proxy, with wearable sensors capable of resolving eye, skin, and other tissue exposure during realistic activities.
- Cover a representative set of deployment scenarios – for example, hospitals, long-term care facilities, offices, classrooms, restaurants, and transportation settings. Provide a brief justification for each scenario selected.
- Modeling of actual exposure, validated against empirical measurements.
- Produce quantitative outputs that could inform installation standards and exposure-limit working groups.
- If relevant, specify a plan for efficient ethics review for any human-subject components.

Expected funds available (for entire technical area): Up to $500,000

Eye-Specific Exposure Safety

Technical Area 4: Conjunctival effects and eye surface assessment

Most far-UVC eye-safety research to date has primarily focused on the cornea, the clear front surface of the eye. The conjunctiva, which covers the white of the eye, has received far less attention, even though both tissues are sensitive to other forms of UV radiation.

This gap has become more important in light of recent evidence that the tear film may provide less protection than previously assumed. Kleiman, Folkerts and colleagues reported at ARVO 2025 that a 5–10 µm human tear film transmits 85–92% of 222 nm light, while cell viability assays suggested that tears offer little protection. As a result, conjunctival and corneal epithelial cells may receive nearly the full incident dose at the ocular surface.

For the corneal epithelium, this exposure is likely mitigated by rapid cell turnover. Surface cells are sloughed within ~24–48 hours, a process that can limit the presence of far-UVC-damaged cells. The conjunctival epithelium and resident immunomodulatory cells turn over on different schedules, and goblet cells – which produce mucins essential for tear film stability – do not turn over as rapidly. Damage to these cells could potentially exacerbate dry eye symptoms or destabilize tear film function over time. To date, the effects of far-UVC on the conjunctival epithelium, goblet cells, and immunomodulatory cells in the conjunctiva remain largely unstudied.

Key questions

- How does far-UVC exposure affect conjunctival epithelial cells, goblet cells, and immunomodulatory cells at different far-UVC doses and dose rates?
- Does far-UVC exposure alter mucin production, and at what dose threshold?
- Are any observed effects of far-UVC on conjunctival tissue reversible, and over what timescale relative to the cells' natural turnover?
- Does conjunctival exposure produce changes that could contribute to dry eye symptoms?
- How do conjunctival findings inform appropriate eye exposure limits?

Proposal guidelines

Competitive proposals will include some or all of the following:

- Conduct *in vitro* work using validated conjunctival tissue model(s) and, where appropriate, an *in vitro* goblet cell model.
- Characterize damage and recovery at a range of doses spanning subthreshold to above-limit exposure, where possible.
- If possible, include a clinical experimental arm, *ex vivo* human-tissue arm, or an experimental arm using an appropriate animal model.
- Justify the choice of model systems and demonstrate their relevance to *in vivo* human conjunctival biology.
- Specify a plan for efficient ethics review for any human-subject components as applicable.

Expected funds available (for entire technical area): Up to $750,000

Technical Area 5: Mechanisms of far-UVC-associated eye irritation

In a simulated office environment with ceiling-mounted KrCl* lamps, Kousha et al. (2024) observed no clinically significant eye discomfort. This is consistent with the hypothesis that the eye exposure from such real-world installations is significantly lower than is currently modeled. By contrast, Sugihara et al. (2024) observed that when subjects' eyes were intentionally exposed directly to 222 nm at 22, 50, and 75 mJ/cm², they reported a transient foreign-body

sensation, epiphora (tearing), and conjunctival hyperemia (redness) that resolved within hours. These reported symptoms differ from classical photokeratitis caused by 254 nm UVC, which has a delayed onset and longer duration; far-UVC-associated discomfort appears to begin and resolve more quickly.

The underlying mechanism for this observed eye effect has not yet been established. Hypotheses include disruption of the tear film, stimulation of corneal nerve endings, photo-oxidative reactions in tear film constituents, or some combination of these factors. If far-UVC-associated discomfort is minor and fully reversible, its implications for exposure limits would differ substantially from those of discomfort that signals lasting tissue damage. Resolving this distinction will be critical to informing any future revisions to ocular exposure guidelines.

Key questions

- What is the underlying mechanism (or mechanisms) for far-UVC-associated transient eye irritation?
- At what threshold dose do biological effects related to irritation begin, and how does this compare to current exposure limits?
- Does eye irritation from far-UVC exposure depend on dose rate, or only on cumulative dose?
- How does irritation vary between subjects, and what individual factors (e.g., tear film quality, baseline ocular surface health) predict susceptibility?
- What is the time course of onset and resolution, and is recovery complete according to biomarker measures as well as symptomatic measures?

Proposal guidelines

Competitive proposals will include some or all of the following:

- Address the mechanism through complementary approaches – biochemical, biomechanical, neurosensory, computational, or clinical observational.
- Include a human clinical investigation component where feasible.
- Apply far-UVC at controlled doses spanning subthreshold to current eye exposure limits.
- Characterize objective signs of eye discomfort (e.g., conjunctival hyperemia, tear film breakup time, *in vivo* confocal microscopy findings, tear inflammatory markers) alongside subjective symptoms.
- Specify a plan for ethics review as applicable.

Expected funds available (for entire technical area): Up to $750,000

Technical Area 6: Dry eye and ocular surface disease

Until recently, a common assumption was that an intact tear film provides significant levels of protection against far-UVC by absorbing a substantial fraction of incident light before it reaches the cornea. Under this assumption, individuals with dry eye or other ocular surface diseases, which can disrupt tear-film coverage or stability, might be expected to face greater risk from far-UVC exposure. However, recent findings presented by Kleiman, Folkerts, and colleagues at ARVO 2025 suggest that the tear film transmits a substantial

portion of far-UVC light, challenging the assumption that it provides significant protection through absorption. These findings shift the focus from the tear film's ability to block far-UVC to whether tear film properties, such as thickness uniformity, breakup pattern between blinks, surface inflammation, and lubrication state, are involved in the overall ocular surface response to far-UVC and, if so, how. Whether these properties meaningfully affect the ocular surface response or have little clinical relevance has not been systematically studied.

The question is pressing if far-UVC is to be deployed broadly: dry eye affects an estimated 5–50% of adults, with prevalence exceeding 30% in some populations over 65 (Stapleton et al. 2017). Risk factors for dry eye, including age, female sex, contact lens use, screen time, and common medications such as antihistamines and antidepressants, may make the condition especially relevant in settings where far-UVC deployment could be valuable, including hospitals, nursing homes, and offices.

Key questions

- Do individuals with dry eye experience greater irritation or measurable changes from far-UVC exposure than healthy controls at the regulatory standard limit?
- Does tear film breakup, thickness non-uniformity, or surface inflammation modify the symptomatic or biomarker response to far-UVC?
- Are there changes in tear film stability, chemistry, corneal surface integrity, or inflammatory markers after exposure that exceed those observed in healthy volunteers?
- Does dry eye subtype (aqueous-deficient vs. evaporative) or severity modify the response?
- Are there practical mitigations (e.g., supplemental lubrication, environmental modifications) that may meaningfully reduce risk in this population?

Proposal guidelines

Competitive proposals will include some or all of the following:

- Recruit participants with diagnosed dry eye, using established diagnostic criteria, alongside matched healthy controls.
- Expose both groups to controlled far-UVC within the regulatory limits, with appropriate sham controls.
- Measure tear film stability, corneal surface changes, subjective symptoms, and inflammatory markers in tear fluid before exposure, immediately after exposure, and at defined follow-up points.
- Justify exposure conditions and dose rationale.
- Justify sample sizes and statistical power.
- Specify a plan for ethics review.

Note: This evaluation could be structured standalone or embedded as a second arm within a broader eye-irritation mechanism study (Technical Area 5). Proposers are encouraged to consider this option.

Expected funds available (for entire technical area): Up to $750,000

Skin-Specific Exposure Safety

Technical Area 7: Age-related variation and thinner-skin populations

The skin's stratum corneum absorbs most far-UVC before it reaches living cells, but its thickness and barrier function can vary with age. Infants aged 3–24 months have a stratum corneum approximately 20–30% thinner than that of adults, and children in general have less developed skin barrier function (Stamatas et al. 2023). Older adults may have skin with altered barrier function and composition (Lee et al. 2021). Whether these differences materially alter the far-UVC risk profile has not been specifically studied. Direct studies involving infants are not feasible for ethical and practical reasons, but age-related questions could be addressed through computational modeling, *ex vivo* studies of neonatal and older-adult skin, and appropriate animal proxies.

Key questions

- Do age-related differences in stratum corneum thickness or composition translate to measurably elevated far-UVC penetration in infants, children, or older adult populations?
- At what far-UVC dose, if any, would infants, children, or older adult populations show measurable biological effects?
- Are existing exposure limits appropriate for these populations, or do they warrant age-based adjustments?

Proposal guidelines

Competitive proposals will include some or all of the following:

- Include computational optical modeling of far-UVC penetration through age-varying skin structures, potentially parameterized with literature or measured stratum corneum thickness, lipid composition, and chromophore distributions.
- Include validated reconstructed skin models reflecting age-related composition, and, where appropriate, *ex vivo* studies using older-adult skin samples.
- Include neonatal animal model studies where appropriate, with justification of species choice and translational relevance.
- Specify measured endpoints, including DNA damage markers (e.g., CPDs), optical transmission, and viable-cell exposure at relevant tissue depths.

Expected funds available (for entire technical area): Up to $600,000

Technical Area 8: Skin type and melanin effects

Melanin provides UV photoprotection by absorbing broadband UV and scavenging free radicals. Studies examining melanin's role in protecting against far-UVC have reached varying conclusions. However, these differences may be due in part to variation in the wavelengths, model systems, and endpoints evaluated. *Ex vivo* human skin showed *lower* DNA damage in darker-skinned donors at 222 nm, while reconstructed human epidermis models at 233 nm showed higher UV-mediated free radicals in tanned skin. These differences make direct comparison difficult, as noted in Görlitz et al. (2024). The findings may reflect methodological differences rather than genuinely opposing roles for melanin. Additional research is needed to clarify and validate these findings.

For this reason, a single well-designed *in vivo* study at a consistent wavelength with a common endpoint panel may resolve this question and inform defensible safety guidance applicable across the diverse populations that may be exposed to far-UVC.

Key questions

- Does Fitzpatrick skin type modify the cellular response to far-UVC at deployment-relevant doses?
- Is melanin photoprotective, neutral, or sensitizing at 222 nm?
- Are erythema thresholds or biomarker dose-response curves different across skin types?
- Do biomarker responses (CPDs, free radical generation, additional DNA/protein damage markers) vary systematically with skin type?
- What practical implications, if any, follow for exposure guidelines that must apply across the full population?

Proposal guidelines

Competitive proposals will include some or all of the following:

- Recruit volunteers across the full range of Fitzpatrick skin types (I through VI) with adequate representation in each category.
- Expose participants to 222 nm far-UVC at consistent doses spanning subthreshold through and above current exposure limits, where possible.
- Measure a consistent endpoint panel: CPD formation, erythema (objective measurement preferred over visual scoring alone), and additional relevant biomarkers.
- Include appropriate controls, including sham exposure and longer-wavelength UV comparators.
- Justify sample sizes and statistical power, particularly for detecting clinically relevant differences across skin types.
- Specify a plan for ethics review.

Expected funds available (for entire technical area): Up to $750,000

Technical Area 9: Photosensitizing medications

Photosensitizing drugs, including tetracyclines, fluoroquinolones, common NSAIDs, hydrochlorothiazide, and others, are widely prescribed medications and taken daily by tens of millions of people. However, whether these medications alter the skin's response to far-UVC has not been adequately studied.

Recent evidence suggests people with photosensitivity disorders who are in treatment may not be impacted by far-UVC. In a study by Christou et al. (2025), researchers tested 83 individuals with photosensitivity disorders, including 46 with confirmed heightened sensitivity to longer UV wavelengths and some participants who were up to 120× more sensitive than healthy volunteers. They found no visible skin reactions at the ICNIRP exposure limit. This is consistent with the biophysical expectation that far-UVC is absorbed in the outermost skin layers before reaching the deeper tissues where these disorders manifest. However, **Christou et al. did not address medication-induced photosensitivity**,

which is mechanistically distinct. Rather than reflecting a deeper-tissue defect, drug-induced photosensitivity typically involves photoactivation of the drug or its metabolites at or near the skin surface. This is the exact depth zone where far-UVC is hypothesized to be absorbed (Hofmann et al. 2021). These findings indicate that additional research is needed to determine whether commonly used photosensitizing medications alter the skin's response to far-UVC at deployment-relevant doses.

Key questions

- Do common photosensitizing medications alter skin response to far-UVC at deployment-relevant doses?
- Does far-UVC directly photoactivate these drugs or their metabolites at or near the skin surface?
- Are there particular drug classes that pose elevated concern, and which (if any) warrant cautious deployment guidance?
- How do interactions vary with drug class, dose, and exposure timing relative to medication ingestion?
- Is there a dose threshold at which any drug-far-UVC interaction becomes clinically meaningful?

Proposal guidelines

Competitive proposals will include some or all of the following:

- Recruit participants across common photosensitizing medication classes.
- Expose small skin areas to controlled far-UVC doses at and above (where possible) current regulatory limits with appropriate controls (sham, drug-free skin areas, longer-wavelength UV comparators).
- Measure relevant endpoints such as erythema assessment, CPD quantification, and additional relevant biomarkers.
- Include a concurrent *in vitro* arm to test whether far-UVC directly photoactivates these drugs or their metabolites in reconstructed skin models.
- Specify a plan for ethics review.

Expected funds available (for entire technical area): Up to $600,000

Technical Area 10: Wound and disrupted-skin exposure

When the stratum corneum is disrupted by wounds, burns, surgical sites, or skin conditions, nucleated cells may be exposed at the skin surface. Hospital settings, where far-UVC deployment may be valuable, are often places where patients with disrupted skin barriers seek care. Early evidence in this area is encouraging. Emerging evidence indicates that wound fluid is protein-rich and likely absorbs far-UVC in much the same way intact skin does, and far-UVC is already being explored clinically for its germicidal benefit on wound surfaces (Narita et al. 2018, Busch et al. 2023). What remains is a need to rigorously characterize the balance between germicidal benefit, tissue exposure, and clinical guidelines for this unique population.

Key questions

- How much far-UVC penetrates through wound fluid and healing tissue at various stages of healing?
- Does wound fluid provide protection analogous to stratum corneum, and over what range of conditions?
- What is the dose-response for cellular damage in tissue beneath wound fluid layers of varying depth?
- How do penetration and tissue response vary across wound types, sizes, and exposure geometries?

Proposal guidelines

Competitive proposals will include some or all of the following:

- Specify the cellular and tissue endpoints to be used (e.g., DNA damage, wound-relevant biomarkers).
- Justify the tissue and wound-fluid models used, including their composition, depth, and healing stages they represent.
- Be explicit about what *in vitro* and *ex vivo* findings can and cannot establish about the effects of far-UVC on actual wounds and what would remain for future work.
- Where a clinical component is included:
    - Specify clinical endpoints (e.g., time to closure, surgical site infection rates, scarring metrics, wound-relevant biomarkers) and a statistical plan with appropriate power justification.
    - Identify a clinical partner or describe a credible plan to develop one. Existing relationships with hospitals or burn centers operating far-UVC are advantageous but not required. For teams that submit strong proposals but do not have preexisting relationships, Blueprint will provide recommendations or facilitate introductions, as appropriate.
    - Specify a plan for ethics review at participating institutions.

Expected funds available (for entire technical area): Up to $750,000

Eligibility requirements

Eligible applicants

Submissions are welcome from all responsible sources, inside and outside the United States, capable of satisfying the requested work in this Request for Proposals.

To avoid conflicts of interest, any individual who contributed substantive written or editorial input to drafts of this Request for Proposals within thirty (30) days prior to its public release is ineligible to serve as a principal investigator on a proposal.

Awards to for-profit entities may be limited or restricted, consistent with applicable laws, regulations, and guidance governing private benefit and inurement. We reserve the right to decline awards to for-profit organizations where such awards would be inconsistent with these requirements.

Blueprint cannot provide awards to any entities subject to U.S. sanctions. Awardees and their key personnel must not appear on the U.S. Treasury Department's Specially Designated Nationals (SDN) List. Blueprint will request identifying information about directors and key personnel as part of award due diligence.

Conflicts of interest

Proposers are required to disclose all potential, real, or perceived organizational conflicts of interest, which may include but are not limited to:

- Current or historical funding received from organizations involved in the manufacture or sale of far-UVC lamps, fixtures, dosimeters, or related products;
- Any relationships between proposers' team members and organizations involved in the manufacture or sale of far-UVC products that are not at arm's length;
- Any direct or indirect financial interest in organizations involved in the manufacture or sale of far-UVC products;
- Any familial, financial, or business connections between proposers and members of the Blueprint Biosecurity team that are not at arm's length.

Guidelines for submission

Stage 1: Expression of Interest

We require proposers to submit an *Expression of Interest* with a summary of proposed work as the first stage of their application. **All submissions should be emailed to** safe-uvc@blueprintbiosecurity.org**.**

Format and length:

- Up to 4 pages, single spaced. There is no expected length – many strong *Expressions of Interest* will be 1-2 pages. The 4-page maximum gives room for submissions covering multiple technical areas.
- Figures, tables, and charts count toward the page limit. The cover sheet, table of contents, bibliography, supplemental papers, rough budget, concurrent-funding list, and conflict-of-interest disclosures do not.
- Please submit as a PDF or Word document, in English.
- We recommend using the *Expression of Interest* template made available alongside this RFP, although it is not required. We care more about the clarity of your plan than perfect formatting or polish.
- Please do not include brochures or marketing materials. Links or supplemental papers may be included but may not be reviewed in their entirety.

Whether or not you use the template, your Expression of Interest must include:

- Applicant name and organization (including organization type and country of primary applicant), a technical and administrative point of contact, key personnel and their affiliations, and whether your team has prior far-UVC experience.
- The technical area(s) you are proposing to study.

- A brief summary of the proposed work and how it addresses the goals of this RFP and your selected technical area(s).
- Your intended approach and study design, including multiple stages or components as appropriate. Bullet points are acceptable.
- A rough timeline with key milestones and deliverables.
- The main technical or feasibility risks to your approach and how you would address them. This does not need to be an exhaustive list.
- A description of your team's previous experience conducting research similar to the proposed work, including relevant personnel roles and related projects. Prior far-UVC experience is not required.
- A requested budget, with a rough approximation of personnel, materials, overhead, and other costs. We encourage budgets for conference travel, presentations, and open-access publications, where appropriate.
- Other funding sources you are pursuing concurrently for this work, including co-funding options or funding sources you would pursue if not selected under this RFP.
- Disclosure of any conflicts of interest (See *Eligibility requirements → Conflicts of interest* above).

We understand that each of the points above may change in the process of developing a *Full Proposal*, including the requested budget. We have listed expected proposal values that represent our best guesses for the maximum amount each study could cost if run efficiently, although we plan to adjust the total funding pool to match the quality of proposals once we see all *Expressions of Interest*. We will consider proposals that exceed the cost guidance for each technical area; such requests will require additional justification and evaluation.

We encourage creative (but rigorous) ways to accomplish the study objectives. **We have a preference for proposals that reasonably aim to achieve their stated deliverables within 24 months or sooner, with the explicit exception of Technical Area 1 (multi-year human exposure study), where longer timelines are inherent to the work.**

Stage 2: Full Proposal

Select proposers will be invited to submit a *Full Proposal* after we review their *Expression of Interest*. A *Full Proposal* will consist of a technical section and a cost section. We will provide templates and further guidance to selected proposers after reviewing their *Expression of Interest*.

Application review

Evaluation criteria

All submissions will be evaluated based on the following criteria:

- **Scientific and technical quality of proposed studies**

Submissions will be evaluated for achievability, reasonableness, and completion. Proposals should include a logical plan with timelines, deliverables, and a clear connection to the goals of this RFP. We will also assess whether the proposed schedule is realistic and whether technical risks are identified with feasible mitigation strategies.

- **Proposer's demonstrated capability and/or related experience**

Submissions will be evaluated for the technical team's experience and expertise relevant to the proposed work. Strong submissions will show a track record of delivering similar projects on time and within budget. Please include any related current or past efforts, with details such as the funder, timeline, summary of progress or results, and award value, to help us assess capability.

- **Cost-effectiveness**

Each submission will be subject to cost analysis to ensure effective, reasonable, and realistic proposed costs for technical work and equipment, labor, and other associated program costs. By 'cost effectiveness', we mean the ability to extract the most useful information for this RFP per dollar spent. By 'cost realism' we mean the necessity of each expense to address the program objectives. By 'cost reasonableness', we mean the justification of the monetary value of those expenses. For example, 'cost realism' would address whether a specific piece of equipment is required for the project, and 'cost reasonableness' would address whether the budgeted cost of that equipment is reasonable.

- **Speed of execution**

Submissions will be evaluated for the speed at which the work is initiated and completed, while not sacrificing scientific integrity. Submitters should identify how their approach will preserve scientific integrity while accelerating the experimental timeline. We recognize that Technical Area 1 is a multi-year study by design; speed-of-execution considerations there will focus on time to enrollment and protocol launch rather than study duration.

Proposal evaluation process

It is the policy of Blueprint Biosecurity to ensure impartial, equitable, comprehensive evaluations of Proposer Submissions. The review team will consist of two team members from Blueprint Biosecurity, as well as a small number of outside contractors, consultants, and/or experts. Review team members will individually evaluate and comment on the proposals. A subsequent discussion will weigh the merits of each proposal to inform funding decisions. Final funding decisions will be made by Blueprint Biosecurity team members. We will identify and execute a mitigation plan for identified conflicts of interest between review team members and any proposals. Our Chief Operating Officer, who will not be part of the review team, will manage this process, and adjudicate conflicts.

Handling of proposal submissions and proprietary information

Blueprint Biosecurity treats all submissions as protected information and will only share them with personnel involved in evaluation. This may include support contractors who assist with administrative or technical review. All contractors performing this role are prohibited from conducting Blueprint-sponsored research and are bound by nondisclosure agreements. Input on technical aspects may also be solicited from external experts under the same confidentiality obligations.

Blueprint Biosecurity will retain an electronic copy of each proposal; all other copies will be destroyed. Submissions will not be returned.

To the extent possible, please submit non-proprietary information. If proprietary or confidential information must be included, it must be clearly marked as "Proprietary," and you must have the authority to disclose it. Such information will be shared only with authorized personnel bound by nondisclosure agreements and used solely for evaluation.

Please note that Blueprint Biosecurity may already possess, or may separately obtain, information similar or identical to your proprietary submission. In such cases, we reserve the right to use that information according to the applicable rights from those sources.

Award information

Proposers may elect to contract subcomponents of their proposed work to other groups.

We reserve the right to:

- Select for negotiation all, some, one, or none of the proposals received in response to this RFP;
- Conduct discussions with proposers if it is later determined to be necessary;
- Select for award entire proposals, or only specific portions;
- Fund awards in increments or upon the achievement of milestones;
- Offer options for continued work and additional funding following completion of the proposed work;
- Request additional documentation once the award has been determined (e.g., representations and certifications); and
- Stop considering a proposal for award if: all parties involved fail to reach agreement on terms (award, technical, milestones, etc.) within a reasonable time; the proposer fails to provide requested additional information; or the application is deemed noncompliant with the requirements of the RFP at any time.

Proposals identified for negotiation may result in a milestone-based contract, depending on the nature of the work proposed, the required degree of interaction between parties, and other factors.

Awardees are responsible for ensuring that research is conducted in compliance with rules set forth by relevant institutional, local, and national research regulatory bodies such as Institutional Review Boards (IRBs) and/or Institutional Ethics Committees (IECs). Awardees shall be solely responsible for ensuring that any goods, services, or deliverables provided under this award do not infringe upon any existing patents, trademarks, or other intellectual property rights.

We retain sole discretion to select awards and to negotiate all terms and conditions with selectees.

Selection notices

We provide the following notices, as applicable, all sent by email to the contact information identified in the *Expression of Interest*:

- **Notice of Disinclination** – the *Expression of Interest* will not proceed to a *Full Proposal.*
- **Notice of Recommendation** – the proposer is invited to submit a *Full Proposal.*
- **Notice of Non-Selection** – the *Full Proposal* was not selected for award negotiation.
- **Notice of Selection** – the *Full Proposal* is selected for award negotiation.

At the *Expression of Interest* stage, Blueprint Biosecurity will respond with either a Notice of Recommendation or a Notice of Disinclination, along with a brief description containing feedback, where possible. All proposers may still submit a *Full Proposal*, regardless of Blueprint Biosecurity's response to their *Expression of Interest*. All conforming *Full Proposals* will be reviewed according to the criteria listed in the "Application review" section; these reviews will be independent of the *Expression of Interest* reviews, though consideration may be given to the proposers' responses to feedback provided.

At the *Full Proposal* stage, proposers will be notified whether their proposal was selected for award negotiation. A Notice of Selection may cover the proposal in whole or in part; Blueprint Biosecurity will initiate negotiations following the notification.

Deliverables

We will negotiate project deliverables with individual awardees. We anticipate that, at a minimum, selected awardees will provide the following:

- Monthly technical reports describing progress toward specific milestones, anticipated future progress, any problem areas, and plans to address these.
- Accompanying quarterly virtual meetings to describe and discuss the technical progress.
- A final report submitted within 60 days of project completion, summarizing the findings.

Proposed project timelines should be no longer than 24 months from contract award, except for Technical Area 1 (multi-year human exposure study), where longer timelines are expected and encouraged.

Awardees must use good faith efforts to publish findings promptly following completion of the applicable work, in a manner designed to maximize broad public dissemination. Peer-reviewed journals and open-access repositories are strongly preferred. Pre-registration of clinical and experimental protocols remains expected where appropriate.

Awardees will have a 12-month exclusive window to publish after completing each phase of work. Following that period, Blueprint or its funders may independently publish or deposit underlying data and datasets, with appropriate attribution to the research team.

If your proposal includes any proprietary components, please clearly identify what they are, why they need protection, and whether there is a way for us to share the information with others where we feel it may advance the scientific field.

Administrative overhead policy

We maintain the following policy that limits indirect costs ("overhead") for any grant we make or recommend:

When making or recommending grants to institutes of higher education, we restrict indirect costs to no more than 10% of direct costs.

Direct costs are defined as expenses that support and advance the project's specific goals; indirect costs are defined as general administrative and operational expenses that are not specifically identified with the funded project.

Questions

Please email all administrative, technical, and contractual questions to safe-uvc@blueprintbiosecurity.org. Questions about this program that are not sent to this email may not be replied to. All questions must be in English, and must include the name, email address, and telephone number of a point of contact.

A comprehensive FAQ document is available on our website.

Where Blueprint Biosecurity deems it to be helpful for all interested parties to the RFP, answers to questions (paraphrased where necessary to protect proposer information) may be posted in a public FAQ on Blueprint Biosecurity's website.