

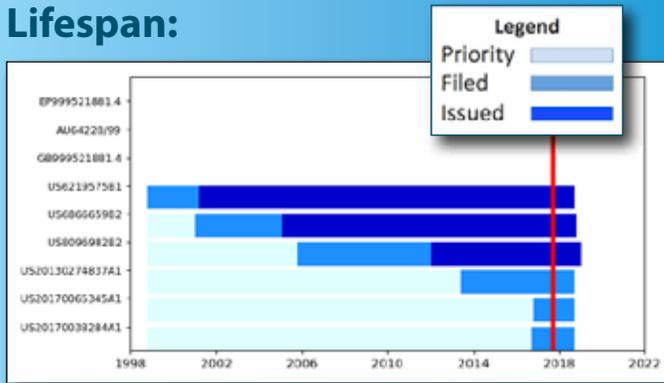
Optical Clearing of Biological Tissue

Patent Portfolio Offering

Quick Facts

- ≈ **Opportunity:** Acquisition of 7 patent assets, including 3 issued US patents, and 1 issued foreign (UK) counterpart, all relating to increasing the optical transparency of biological tissues
- ≈ **Earliest priority:** October 23, 1998
- ≈ **Technology:** Enabling improved optical diagnostics and therapy by enhancing optical transparency of biological tissues
- ≈ **Encumbrances:** No current encumbrance
- ≈ **Average Lifespan:** 1.2 years

Lifespan:



Portfolio Overview

Appplied Tissue Optics, Inc. ("ATO") is offering this patent portfolio for cash sale. This portfolio, comprising 6 patent assets and one foreign (UK) counterpart, relates to increasing the optical transparency of biological tissues, which is a fundamental approach to enable improvement in the vast majority of optical diagnostic and therapeutic procedures directed at biological tissues. The ATO proprietary approach involves reduction of the native scattering properties of biological tissues, by several hundred percent, through the administration of a topical clarifying agent. Applications could range from improving aesthetic treatments, such as laser tattoo removal, laser treatment of pigmented and vascular lesions, laser hair removal, laser skin rejuvenation, laser acne treatment, to ophthalmic procedures, involving transscleral laser treatment of glaucoma, or retinal conditions, to a wide range of optical diagnostic and optical biopsy procedures.

The claims in this portfolio are fundamental to altering the optical properties of tissue using the topical administration of chemical agents, which is the method practiced widely in biomedical optics for optical clearing of tissue.

ATO's portfolio, reaching back to 1998 and covering the remote future, anticipates much of the development that has occurred in the field of biomedical optics, in advancing optical clearing of tissues. The origins of this portfolio pre-date, by several years, the earliest publications on the approach that is currently established as optical clearing of tissues.

ATO's patented approach is foundational to the future of biomedical optics, for a wide range

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Patent Portfolio Offering

Portfolio Overview (continued)

of current and emerging optical diagnostic and therapeutic systems. The breadth and depth of this portfolio across a wide range application domains indicates that this portfolio is a strategic asset.

Being early, some of the claims of the portfolio are extremely broad. For example, consider claim 1 of US 6,219,575:

Method for performing a diagnostic or therapeutic procedure on a biological tissue, comprising: a) bypassing the surface permeability barrier, b) delivering a chemical agent for optical clearing of tissue, and c) performing said diagnostic or therapeutic procedure.

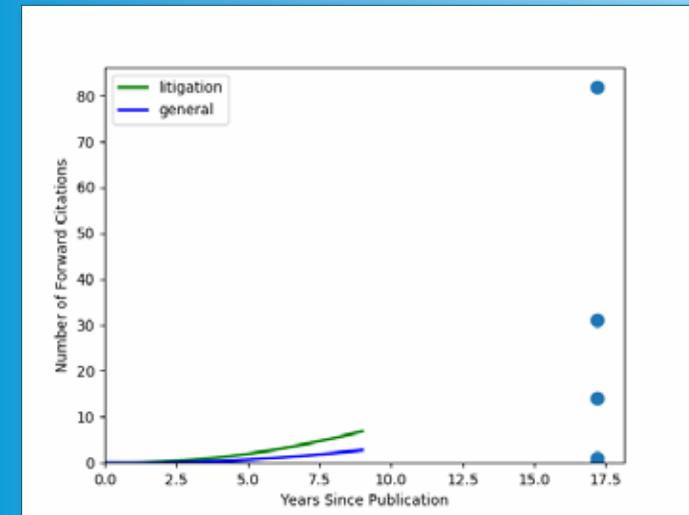
This broad claim reads like the introductory sentence of an industry standard on how to carry out optical clearing in biological tissues.

Given the breadth and depth of the art taught in this patent portfolio on optical clearing, the value of this portfolio could be monetized through a wide range of diagnostic and therapeutic application domains. Moreover, the forward citation chart of the portfolio corroborates its utility. The chart shows above litigation grade citations for the late stage assets, indicating the potential that these assets are fundamental to their space.

Market Overview

The field of biomedical optics has long been recognized by the National Research Council as the key science upon which the next generation of clinical tools and biomedical research will be based. Its applications span a wide range of clinical and
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Forward Citations



The graph compares forward citation scores of the patents in this portfolio (blue dots) against the scores for all US patents (blue line) and for litigated US patents (green line). For each patent, forward citations are counted for both the application and the granted version. Richardson and Oliver Law Group developed the scoring system.

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Patent Portfolio Offering

Forward Citations Parties

Party	Cites
Emkinetics, Inc.	18
Reliant Technologies, Inc.	17
Daniel Rogers Burnett	7
Clearside Biomedical, Inc.	6
Burnett Daniel R	6
Covidien Lp	5
Emory University	4
Board Of Regents, The University Of Texas System	4
Michael Black	3
Restoration Robotics, Inc.	2
Michael P. O'Neil	2
Nellcor Puritan Bennett Llc	2
Debenedictis Leonard C.	2
Reliant Technologies, LLC	2
Emkinetics	2
Biotex, Inc.	2
Ann-Shyn Chiang	2
Card Guard Scientific Survival Ltd.	2
Babak Nemati	2
The General Hospital Corporation	2
Tyco Healthcare Group Lp	2

Complete Forward Citations Parties list available in a separate schedule

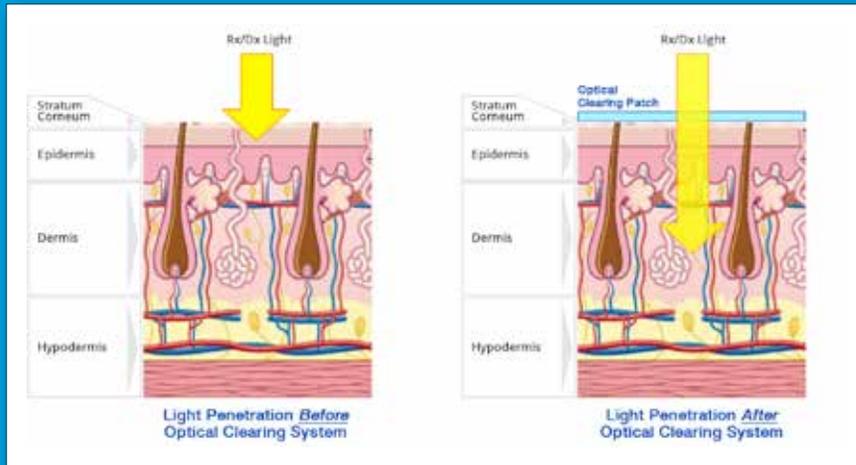
Market Overview (continued)

non-clinical applications to include oncology (photodynamic therapy), dermatology (laser treatment of pigmented and vascular lesions), ophthalmology (treatment of retinal disease), orthopedics (arthroscopic surgery), general surgery (endoscopic surgery), diagnostics (optical coherence tomography, microscopy), aesthetic surgery (laser tattoo removal, laser skin rejuvenation, laser hair removal), and drug discovery. Fundamental to all of the above applications is the delivery of light through overlying tissues, to deliver a sufficient dose of light to a target that is imbedded in tissue (e.g. lesion, vessel, tattoo pigment). ATO's technology enables a safer and more effective approach for all of the above applications by creating temporary optical transparency of the overlying tissues. The aggregate market opportunity for the above is tremendously large. For aesthetic surgery alone, each market segment is a multibillion dollar market opportunity. For instance, the revenues associated with the overall tattoo industry in 2017 are estimated at \$3.4B. The global aesthetic laser market size is valued at \$0.5 B in 2015 and expected to grow at a CAGR of around 15.5% through 2024. The ATO technology stands to significantly disrupt and expand all of these market segments by enabling diagnostics and treatment capabilities that were previously not feasible with standard optical and laser modalities.

Optical Clearing of Biological Tissue

Patent Portfolio Offering

Covered Product



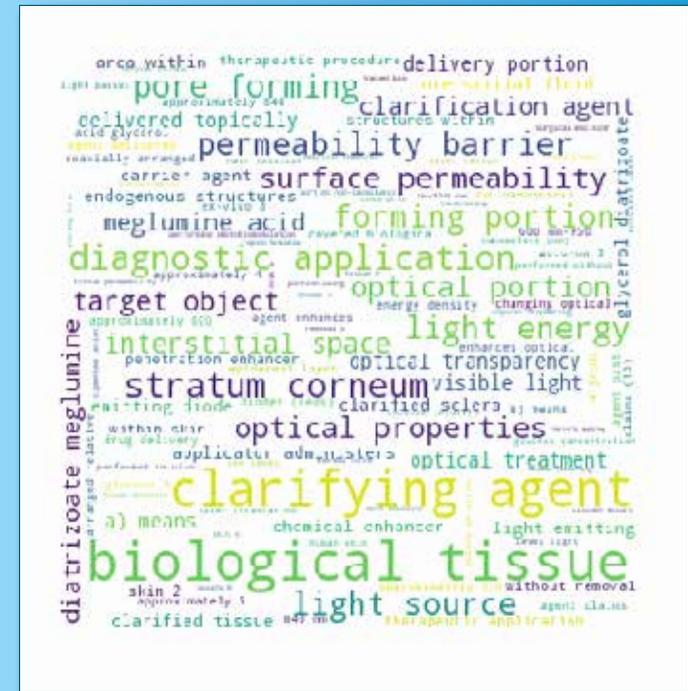
Exemplar Claim

Claim 1 of U.S. Patent No. 6,219,575 B1:

Method for performing a diagnostic or therapeutic procedure on a first biological tissue having interstitial space therein and covered by a surface permeability barrier of a second tissue, said diagnostic and therapeutic procedure requiring optical access into said covered first biological tissue, said method comprising:

- Providing means for bypassing said surface permeability barrier of second tissue to permit the delivery of a clarifying agent past said surface permeability barrier of second tissue directly to said interstitial space within said covered first biological tissue,
- Delivering said clarifying agent past said surface permeability barrier of second tissue directly to said interstitial space within said covered first biological tissue to enhance the optical transparency of said covered first biological tissue on a transient basis,
- Performing said diagnostic or therapeutic procedure on said covered first biological tissue while the optical transparency thereof has been enhanced.

Claim Word Cloud



Asset List

Number	Online	Juris	Title	Status	Priority	Filed	issued	Expiration	App Number	RoI Score	Citations	Years Since Pub
US20170038284A1	US20170038284A1	US	Systems for augmenting optical transmission through biological tissues	application	1998-10-23	2016-10-21		2018-10-23	US15331785			17.2
US20170065345A1	US20170065345A1	US	Systems for augmenting optical transmission through biological tissues	application	1998-10-23	2016-11-18		2018-10-23	US15356427			17.2
US20130274837A1	US20130274837A1	US	Systems and Methods to Enhance Optical Transparency of Biological Tissues for Photobiomodulation	application	1998-10-23	2013-06-11		2018-10-23	US13914813			17.2
US8096982B2	US8096982B2	US	Method and apparatus to enhance optical transparency of biological tissues	application	1998-10-23	2005-10-27	2012-01-17	2019-01-18	US11262082	21.47	2	17.2
US6866659B2	US6866659B2	US	Method to enhance optical transparency of biological tissues	issued	1998-10-23	2001-02-07	2005-03-15	2018-11-21	US09777639	52.04	27	17.2
US6219575B1	US6219575B1	US	Method and apparatus to enhance optical transparency of biological tissues	issued	1998-10-23	1998-10-23	2001-04-17	2018-10-23	US09177348	66.47	82	17.2
GB999521881.4		GB	Enhancing Optical Transparency of Biological Tissues	issued								
AU64228/99		AU	Enhancing Optical Transparency of Biological Tissues	abandoned								
EP999521881.4		EP	Enhancing Optical Transparency of Biological Tissues	abandoned								

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Patent Portfolio Offering



Offering Process

- ≈ All offers to purchase the Portfolio must be submitted in writing to info@AQUALicensing.com.
- ≈ There is no reserve price for this offering.
- ≈ Offers should be single payment cash purchase price offers.
- ≈ AQUA will review the bids with Seller, and identify the highest bid. Sellers will either accept the highest bid or choose to initiate a subsequent round of bidding.
- ≈ AQUA will communicate status – of either accepting a winning bid or proceeding to a subsequent round of bidding.
- ≈ Subsequent Bidding – At the start of a subsequent bidding round (if any), we will communicate to all invited parties the new reserve price and subsequent bid date, as well as the number of bidders who participated in the previous round. Subsequent bid dates will be within 3-5 business days of prior bid dates. These subsequent bidding rounds will conclude when there is only one bidder remaining.
- ≈ Closure – Once the winning bidder has been accepted by Sellers, we will bring the winning bidder and Sellers together to negotiate the closure of the Patent Sales Agreement (PSA).
- ≈ AQUA reserves the right to terminate the sale process without cause at any time.

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