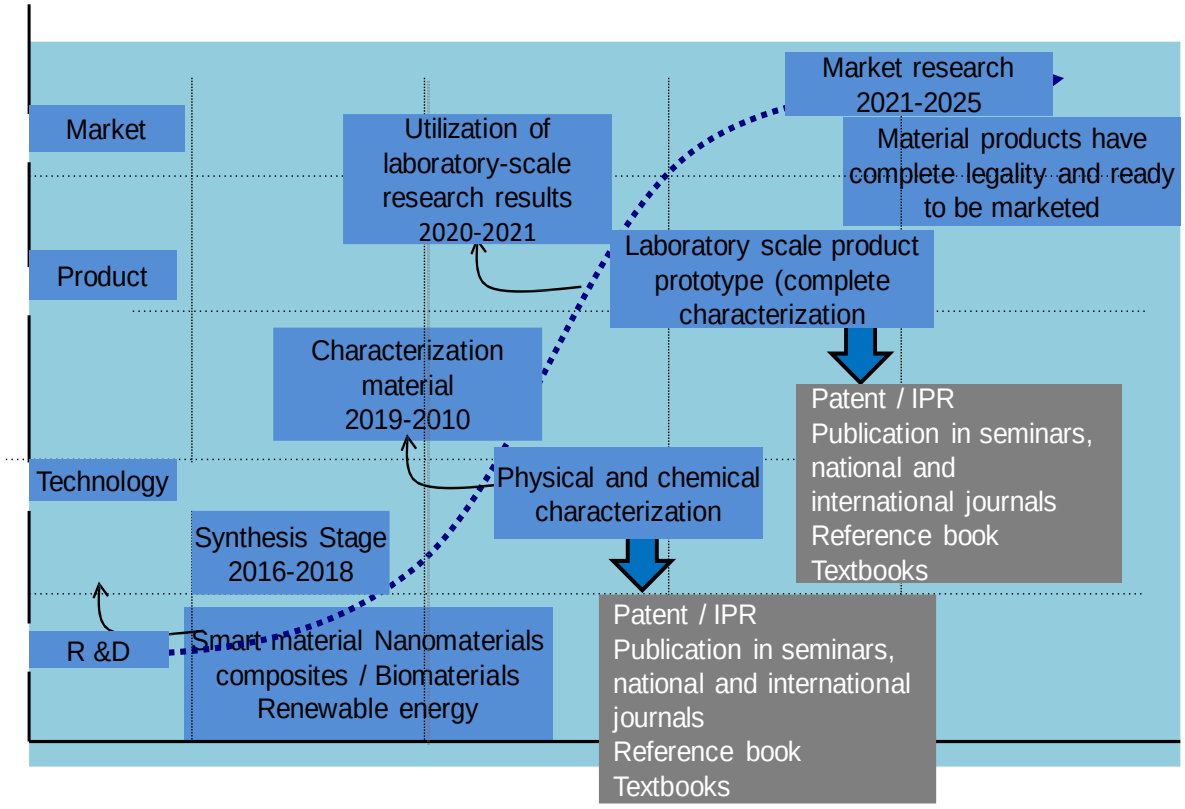
Research Area
Material Chemistry and Renewable Energy

Our research is more focused on material chemistry and renewable energy mainly in the research with natural resources exploration from Indonesia. It includes synthesis and material characterization by using various instruments, research innovations to produce smart material, nanomaterial, biomaterial, membrane, catalyst and sustainable natural dye. Those materials are already applied in various industries such as medicine, pharmacy, health, environment, creative industry, and renewable energy.

Personnel		
Team Research Area Material Chemistry and Renewable Energy		
	Prof. Dr. Sari Edi Cahyaningrum, M.Si.	**Research Area**: Material chemistry and biomaterial: Chitosan and hydroxyapatite synthesis, characterization, modification and its application in enzyme encapsulation, environment, food, medicine, and pharmacy.
	Dr. Amaria, M.Si.	**Research Area**: Silica based materials and modification: Synthesis, characterization and application of material for valuable chemical recovery, and green environmental remediation.
	Prof. Dr. Nita Kusumawati, M.Sc.	**Research Area**: Engineering polymer membranes and biofilms, Engineering dye sentisized solar cell (DSSC), Exploration, standardization dan aplication of halal gelatin, Exploration, standardization dan aplication of natural dyes.
	Dr. Pirim Setiarso, M.Si.	**Research Area**: Electrochemistry: Manufacture of nanoelectrodes for voltammetric analysis of samples, developing DSSC.

	Prof. Dr. Titik Taufikurohmah, M.Si.	**Research Area**: Nano materials of precious metals: gold (Au), silver (Ag), platinum (Pt) and their applications in cosmetics, medicine, both chemical and herbal. Nanogold, nanosilver and nano platinum combine with various Indonesian herbs into nanoherbal products.
	Dr. Maria Monica S.B.W., M.Si.	**Research Area:** Synthesis and characterization of Molecular Imprinted Polymer (MIP), the utilization of MIP for removal or precontration of certain antibiotic or drug, photometric reaction for analysis uncolour antibiotic or drug based on diazotization process for analysing trace amount of prohibited antibiotic or drug in “food-producing animals”, developing photometric sensor for analysing uncolour antibiotic or drug.
	Dr. IGM Sanjaya, M.Si.	**Research Area:** Theoretical and computational chemistry: Chemistry of material and energy, green-synthesis nano material, teaching chemistry, online and blended learning in science and chemistry.
	Dina Kartika M, S.Si., M.Sc.	**Research Area:** Nanocomposite material, biopolymer -inorganic polymer nanocomposite, sol-gel synthesis, heterogeneous catalyst, photocatalytic and catalytic studies, renewable energy and biofuel product
	Samik, S.Si., M.Si.	**Research Area:** Catalyst: heterogeneous catalyst, synthesis, characterization, modification and its application to produce renewable energy such as biodiesel.
	Amalia Putri Purnamasari, S.Si., M.Si.	**Research Area:** Heterogeneous Catalysts: Modification, impregnation, characterization, and application to produce renewable energy such as biodiesel. Such as CaO impregnated in H-ZSM-5 as heterogeneous catalysts to produce FAME (Fatty Acids Methyl Esther).

ROADMAP OF MATERIAL CHEMISTRY AND RENEWABLE ENERGY



Research Project:

1. Application of Nanomaterial Hydroxyapatite Silver Fluoride Chitosan Technology for Reconstruction of Fractured Teeth (2021, DRPM)
2. Standardization of Production of Ethanol-Based Hand Sanitizer (HSBE) made from local commodities and lignocellulosic waste to reduce the potential for counterfeiting in the prevention of Covid-19 transmission (2021, DRPM)
3. Prevention of Virus Carrier Functions in Children in the Covid-19 Pandemic Era Through the Production of Herbal Jelly Drink (2021, DRPM)
4. Manufacturing of Nanogold-Nanosilver Drugs to Support the Development of Domestic Drug Raw Materials (2021, DRPM)
5. Synthesis of ZSM-5 Hierarchy Based on Natural Kaolin Bangka as a Catalyst Material for Biojetfuel Conversion (2021, PNBP UNESA)
6. Unesa Eco-Batik Pilot Scale Fabrication as an Effort to Realize the 2030 Sustainable Development Goals (SDGs) (2021, PNBP UNESA)
7. Phenol Disinfectant Analysis by Cyclic Voltametry (2020, DRPM)
8. Antimicrobial Food Packaging Based on Local Natural Materials as an Effort to Prevent the Spread of Covid-19 (2020, PNBP UNESA)
9. Prevention of Virus Carrier Functions in Children in the Covid-19 Pandemic Era Through the Production of Herbal Jelly Drink (2020, PNBP)

10. Synthesis and Characterization of Indonesian Local Based Bone Grafts as Candidates for Bone Implants to Support Independent Indonesia in the Field (2020, DRPM)
11. Standardization of Production of Ethanol-Based Hand Sanitizer (HSBE) Made from Local Commodities and Lignocellulosic Lime to Reduce Counterfeiting Potential in Prevention of Covid-19 Transmission (2020, PNBP UNESA)
12. Metmorphine Encapsulation with Chitosan Alginate Composite as Anti Diabetes Type 2 Drug Slow-Release System (2020, DRPM)
13. Manufacturing of Nanogold-Nanosilver Drugs to Support the Development of Domestic Drug Raw Materials (2020, DRPM)
14. Synthesis of Amino Acid Functionalized Gold Nanoparticles and Its Application as a Heavy Metal Ion-Ion Calorimetry Sensor (2019, PNBP UNESA)
15. Utilization of Pad Steam Dyeing (PSD) Technology to Increase The Effectiveness and Efficiency of Pilot-Line Eco Batik Dyeing at the State University of Surabaya (2019)
16. Utilization of Chitosan-TiO2-Based Environmentally Friendly Materials for Anti-UV Applications and Textile Self Cleaning (2019)
17. Optimization of The Diazo Reaction to Increase the Sensitivity of Photometric Analysis of Chloramphenicol (2019)
18. Utilization of TiO_2-Based Nano Composites as Self-Cleaning Coating Materials on Acrylic Paints (2019)
19. Stability study of gold nanoparticles using amino acid stabilizers (2019, PNBP)
20. Manufacturing of Nanogold-Nanosilver Drugs to Support the Development of Domestic Drug Raw Materials (2019, DRPM)
21. Optimization of the Synthesis of Chitosan/Collagen/Hydroxyapatite Biomaterials from Beef Bone as a Bone Tissue Substitute (2019, DRPM)
22. Standardization of Dyeing and Encapsulation of Natural Dyes Psidium guajava, Syzgium aqueum, Garcinia mangostana as the Leading Green Technology of the Textile Industry (2019, DRPM)
23. Metformin Encapsulation with Chitosan Alginate Composite as Anti Diabetes Type 2 Drug Slow-Release System (2019, DRPM)

Patent / Intellectual Property Rights:

Title	Patent ID	Year
Materials and Process of Pirazinamide Encapsulation Using Chitosan Calcium Alginate with Tween 80 Emulsifier	Status: Granted	2018
Synthesis of Hydroxyapatite from Eggshells by Base Sedimentation Method	682018	2018
Basics of biomaterial development		2018
The Process of Making Night Cream Made from Active Papaya Leaf Extract as Anti-Acne	P00201805096	2018
The Process of Making Moisturizing Cream by Adding Lime Skin Extract	P00201805106	2018
The Process of Making Cream Scrub from Cocoa Powder Combined with Honey and Milk Powder	P00201805091	2018
The Process of Making Night Cream from Nanogold and Moringa Leaf Extract and Its Use in Making Antiaging Cosmetics	P00201805095	2018
Use of Nanoemulsion of Lime Extract (Citrus Aurantifolia S.) as Active Ingredients for Making Whitening Cream	P00201805094	2018
Betasianin Extraction Method from Red Dragon Fruit (Hylocereus Costaricensis) as a Natural Color in Lipstick preparations	P00201805104	2018
The Process of Making Moisturizing Cream Made from Active Extract of The Cocoa Beans (Theobroma cacao L) in a Combination of Honey Bees	P00201805103	2018
Use of Nanoemulsion Temulawak Extract in Whitening Cream to Brighten, Smooth and Tighten Facial Skin	P00201805102	2018
The Process of Making Night Cream with Japanese Celery Leaf Extract or Ashitaba as Lightening Skin	P00201805099	2018
Nanogold Making Method Using Sugar Matrix (Sucrose) and Its Use for Moisturizing Cream with Addition of Carambola Extract	P00201805105	2018
Mask Making Method from Pomegranate Skin Extract to Maintain Facial Skin Health	P00201805097	2018
The Process of Making Day Cream from Active Ingredients Papaya Leaf Extract as an Anti-Acne Product	P00201805096	2018
The Process of Making Day Cream Made from Active Black Cumin Extract	P00201805113	2018
The Process of Making Antiaging Made from Active Extracts of Trembesi Seeds (Samanea Saman) as Antioxidants on the Skin	P00201805101	2018
The Process of Making Chitosan-Aloe Vera Nanoparticles and Their Use in Making Anti-Acne Creams	P00201805110	2018
The Process of Making Whitening Cream from Carambola Wuluh (Averrhoa Bilimbi) with Citric Acid Active Ingredients and Their Use in Cosmetics Manufacturing	P00201805108	2018
Making Lipstick Using Mangosteen (Garcinia Mangostana L) Skin Extract as a Lipstick Color	P00201805092	2018

Making Process of Moisturizing Cream Made from Active Papaya Leaf Extract (Cariaca Papaya L.)	P00201805114	2018
The Process of Making Night Cream from Nanogold and Coffee Skin Extract and Its Use as an Antioxidant	P00201805088	2018
The Process of Making Day Cream with Active Soy Bean Extract (Glycine Max) in the Form of Nanomaterials	P00201805085	2018
The Process of Making Whitening Cream with Strawberry Fruit Extract (Fragaria X Ananassa)	P00201805089	2018
The Process of Making Strawberry Fruit Cream (Fragaria X Ananassa D.) as an Antioxidant	P00201805334	2018
Process of Making Antiaging Cream from Extra Moringa Leaves	P00201805327	2018
Day Cream Making Method Using Noni Seed Extract	P00201805322	2018
The Process of Making Nanosilver Day Cream Made from Ketapang Leaf Extract as Sunscreen	P00201805331	2018
Formula Whithening Cream Active Ingredients Extract Dragon Skin (Hylocereus Polyrhizus) and Aloe Vera Combination	P00201805336	2018
Making a Face Mask by Utilizing Sweet Orange Skin	P00201805326	2018
The Process of Making Moisturizing Cream with Aloe Vera Extract	P00201805335	2018
Halal Gelatin and the Method of Making it	P00201606112	2018
	P00201805325	2018
Herbal Empon-empon Powder and Manufacturing Method	P00201810039	2018
Making Water-Based Natural Dyes and Their Application Methods	P00201810035	2018
The Process of Making Nanogold Using Polyvinyl Pyrrolidone (PVP) Matrix and Its Use in the Formula for Leprosy / Leprosy	Registered	2017
Nanogold Making Method Using Polyvinyl Pyrrolidone (PVP) Matrix and Its Use in Toxoplasmosis Disease Formula Formula	Registered	2017
The Process of Making Nano Seaweed or Nanoseaweed and Its Use in Making Cosmetics	P00201705279	2017
The Process of Making Seaweed Nano or Nanoseaweed and Its Use in Making Supplements	P00201705280	2017
The Process of Making Seaweed Nano or Nanoseaweed and Nanogold and Their Use in Cosmetics Manufacturing	P00201705278	2017
The Process of Making Seaweed Nano or Nanoseaweed and Nanogold and the Use of Both in Making Supplements	P00201705281	2017
Cosmetic Chemistry	C00201602923	2017
Nanogold Synthesis Using Matrix Mono Glyceryl Stearate as Antiaging Compounds in Modern Cosmetics	C00201702802 No: 088000	2017
Article: Histology Study: Pre-Clinic Test of Nanogold In Mus Muscullus Skin, at Fibroblast Proliferation and Collagen Biosynthesis	C00201702751 No: 087960	2017
Article: Synthesis Colloidal Platinum Nanoparticles with Variance Silver Ion and Characterization with UV-Vissible Spectrophotometer and TEM Analysis	C00201702752 No: 087961	2017
Article: Mercury Exposure to Skin Tissue of Mus Muscullus as Fibroblast Cell Proliferation and Collagen Quantity	C00201702758 No: 087967	2017

Article: TEM Analysis of Gold Nanoparticles Synthesis In Glycerin: Novel Safety Materials in Cosmetics Recovery Mercury Damage	C00201702753 No: 087962	2017
Article: Synthesis Of Nanogold and Stability Test of This Colloidal as Essential Material in Drug, Supplement and Cosmetics	C00201702754 No: 087963	2017
Article: Stability of Colloidal Silver Nanoparticles Synthesized with Variance Silver Ions as Antimicrobial in Cosmetic Formulation	C00201702755 No: 087964	2017
Article: Activity Test of Nanogold for Reduction of Free Radicals, a Pre-Assesment Utilization Nanogold in Pharmaceuticals as Medicines and Cosmetics	C00201702756 No: 087965	2017
Article: Histochemical Changes in Liver and Kidney of Mice Exposed to Mercury and Its Recovery with Nanogold	C00201702757 no: 087966	2017
Nanogold as Supporting Activities of Conventional Sunscreen of Octyl-P-Methoxycinnamate to Inhibit Photoaging	C00201702801 No: 087999	2017
Article: Increased Activity Compounds Sunscreen Octyl P-Methoxycinnamate Using The Matrix Ti-Bentonite	C00201702800 No: 087998	2017
Basic Chemistry	C00201602906 no: 083837	2017
Adaptation Method for Gold / Au (III) Metal Cation from Liquid Waste with Saccharomyces cerevisiae Biomass and Its Desorption Method	IDP000042867	2017
Transition Group of Inorganic Chemistry	ISBN: 978-602-449-086-7	2017
Chemistry Literature	ISBN: 978-602-449-063-8	2017
Inorganic Chemistry	83838	2016
Basic Chemistry	83838	2016
Chitosan Based Biomaterials	82602	2016
The Process of Making Nanogold Using a Sugar (Sucrose) Matrix and Its Use for Oral Supplements and Medicines	Registered	2016
Methods of Making Nanoplatines Using Matrices of various Cream Base Materials and Their Use for Cosmetics	Registered	2016
External preparations of skin containing nanoplatina with glycerin matrix as a skin ointment and external medicine	Certified	2016
The Process of Making Nanoplatina Using a Sucrose Matrix and Its Use for Supplements and Peroral Medicine	Certified	2016
Inorganic Chemistry	Nomor pencatatan Hak Cipta: 082603	2016
Basic Chemistry	Nomor pencatatan Hak Cipta: 083838	2016
Organization and Management of Chemistry Education Laboratories	Nomor pencatatan Hak Cipta: 081931	2016
Basic Chemistry	Nomor 083838	2016
Main Group of Inorganic Chemistry	Nomor 82917	2016

Modified Batik Night (Wasp Night, Night Waste, Gondorukem, Kendal) and Its Manufacturing Methods	P00201606112	2016
Making Batik Natural Dyes from Mangosteen Skin Waste Material and Its Application in Cotton Fabric Staining	P00201606113	2016
The Making of Batik Natural Dyes from the Citrus Skin Waste Material and Its Application in Staining Cotton Fabric	P00201606111	2016
Polysulfone Composite Membrane (PSf) - Polyvinylidene fluoride (PVDF) and its method of manufacture	P00201606108	2016
Polyetherimide (PEI) Asymmetry Membrane and Manufacturing Method	P00201606109	2016
Preparation Method for Polyvinylidene fluoride Composite Membrane (PVDF) - Polysulfone (PSf) with Phase Inversion Method and Immersion Technique - Precipitation in Cellulose Support Layer	S10201506764	2015
Modification Method for Making Batik Night with Double Component Blending using Batik Night, Gondorukem, Paraffin and Kendal Waste Materials	S10201506763	2015

Publication

No.	Year	Title	Name of Journal	Quartil	Journal/Prosiding	URL/DOI
1	2020	Preparation And Characterization Of Goatskin Gelatin As Halal Alternative To Bovine Gelatin	Rasayan Journal of Chemistry 13(1)	Q2	Journal	http://dx.doi.org/10.31788/RJC.2019.1245409
2	2020	Extraction, Optimization, And Dyeing Standardization Using Fresh Orange Citrus Peel On Cotton Fabrics	International Journal on Advanced Science, Engineering and Information Technology 10(3)	Q2	Journal	http://dx.doi.org/10.18517/ijaseit.10.3.3430
3	2020	Critical Study Of Stem-Based Learning In Order To Develop Century Skills 21	Journal of Physics: Conference Series 1569(2)	Q4	Conference Proceedings	http://dx.doi.org/10.1088/1742-6596/1569/2/022020
4	2020	New Natural Dyes Development: Caesalpinia Sappan L.-Curcuma Longa Blended Dyes	Rasayan Journal of Chemistry 13(2)	Q2	Journal	http://dx.doi.org/10.31788/RJC.2020.1325410
5	2020	Development Of Web-Based Research And Community Service Database At Universitas Negeri Surabaya	Journal of Physics: Conference Series 1577 (1)	Q4	Conference Proceedings	https://iopscience.iop.org/article/10.1088/1742-6596/1577/1/012042/pdf
6	2020	The Encapsulation Of Metformin On Chitosan Matrix As Diabetes Mellitus Drug Slow Release System	Rasayan Journal of Chemistry 13(1)	Q2	Journal	http://dx.doi.org/10.31788/RJC.2020.1315551
7	2019	Graphene Oxide-Paraffin As Working Electrode For Cyclic Voltammetry Analysis For Cadmium(II)	Asian Journal of Chemistry 31(3)	Q4	Journal	https://doi.org/10.14233/ajchem.2019.21692
8	2019	Impact Of Curing And Extraction Time On Yield And Quality Of Base Gelatin From Goat Skin	IOP Conf. Series: Earth and Environmental Science	Q4	Conference Proceedings	https://doi.org/10.1088/1755-1315/347/1/012083

No.	Year	Title	Name of Journal	Quartil	Journal/Prosiding	URL/DOI
9	2019	The Development Of Pvdf/Pei Blended Membrane: Effect Of Stirring Time On Membrane Characteristics And Performance	Rasayan Journal of Chemistry 12(2)	Q2	Journal	http://dx.doi.org/10.31788/RJC.2019.1225104
10	2019	Synthesis Hydroxyapatite/Collagen/Chitosan Composite For Tissue Engineering	Journal of Physics: Conference Series 1317(1)	Q4	Conference Proceedings	https://iopscience.iop.org/article/10.1088/1742-6596/1317/1/012037/pdf
11	2018	Transport Properties, Mechanical Behavior, Thermal And Chemical Resistance Of Asymmetric Flat Sheet Membrane Prepared From Psf/PVDF Blended Membrane On Gauze Supporting Layer	Indonesian Journal of Chemistry 18(2)	Q3	Journal	https://doi.org/10.22146/ijc.27272
12	2018	Synthesis Of Graphene Oxide Electrode for Paracetamol Analysis By Cyclic Voltammetry	Asian Journal of Chemistry 30(10)	Q4	Journal	https://doi.org/10.14233/ajchem.2018.21460
13	2018	Synergistic Ability of Psf And Pvdf To Develop High-Performance Psf/PVDF Coated Membrane For Water Treatment	Rasayan Journal of Chemistry 11(1)	Q3	Journal	https://doi.org/10.7324/RJC.2018.1112018
14	2018	Polysulfone/Polyvinylidene Fluoride Composite Membrane: Effect of Coating Dope Composition on Membrane Characteristics And Performance	Rasayan Journal of Chemistry 11(3)	Q4	Journal	http://dx.doi.org/10.31788/RJC.2018.1133020
15	2018	Fabrication Of Nanohydroxyapatite/ Scrawl Collagen/Chitosan Composite For Bone Graft Candidate	Rasayan Journal of Chemistry 11(2)	Q3	Journal	http://dx.doi.org/10.31788/RJC.2018.1121916
16	2018	Nanogold's Influence on Antioxidant Activity Of Green Tea Extracts In The Framework Of New Essential Ingredients Discovery In Cosmetic Formulation	Journal of Physics: Conference Series 1108 (1)	Q4	Conference Proceedings	https://iopscience.iop.org/article/10.1088/1742-6596/1108/1/012109/pdf

No.	Year	Title	Name of Journal	Quartil	Journal/Prosiding	URL/DOI
17	2018	The Clinical Test of Nano Gold Cosmetic For Recovering Skin Damage Due To Chemicals: Special Case	Journal of Physics: Conference Series 947 (1)	Q4	Conference Proceedings	https://iopscience.iop.org/article/10.1088/1742-6596/947/1/012056/pdf
18	2018	Nanogold's Influence on Antioxidant Activity Of Green Tea Extracts In The Framework Of New Essential Ingredients Discovery In Cosmetic Formulation	Journal of Physics: Conference Series 1108(1)	Q4	Conference Proceedings	https://doi.org/10.1088/1742-6596/1108/1/012109