Pemanfaatan Kitosan dan Turunannya Sebagai Matrik Prekursor dan Anti-Mikrorganisme Hama Kelapa Sawit

Bumitama Gunajaya Agro

Oleh:
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- Dr. DEWI AGUSTINA (TK,FT, UNILA)

TUJUAN PROJECT

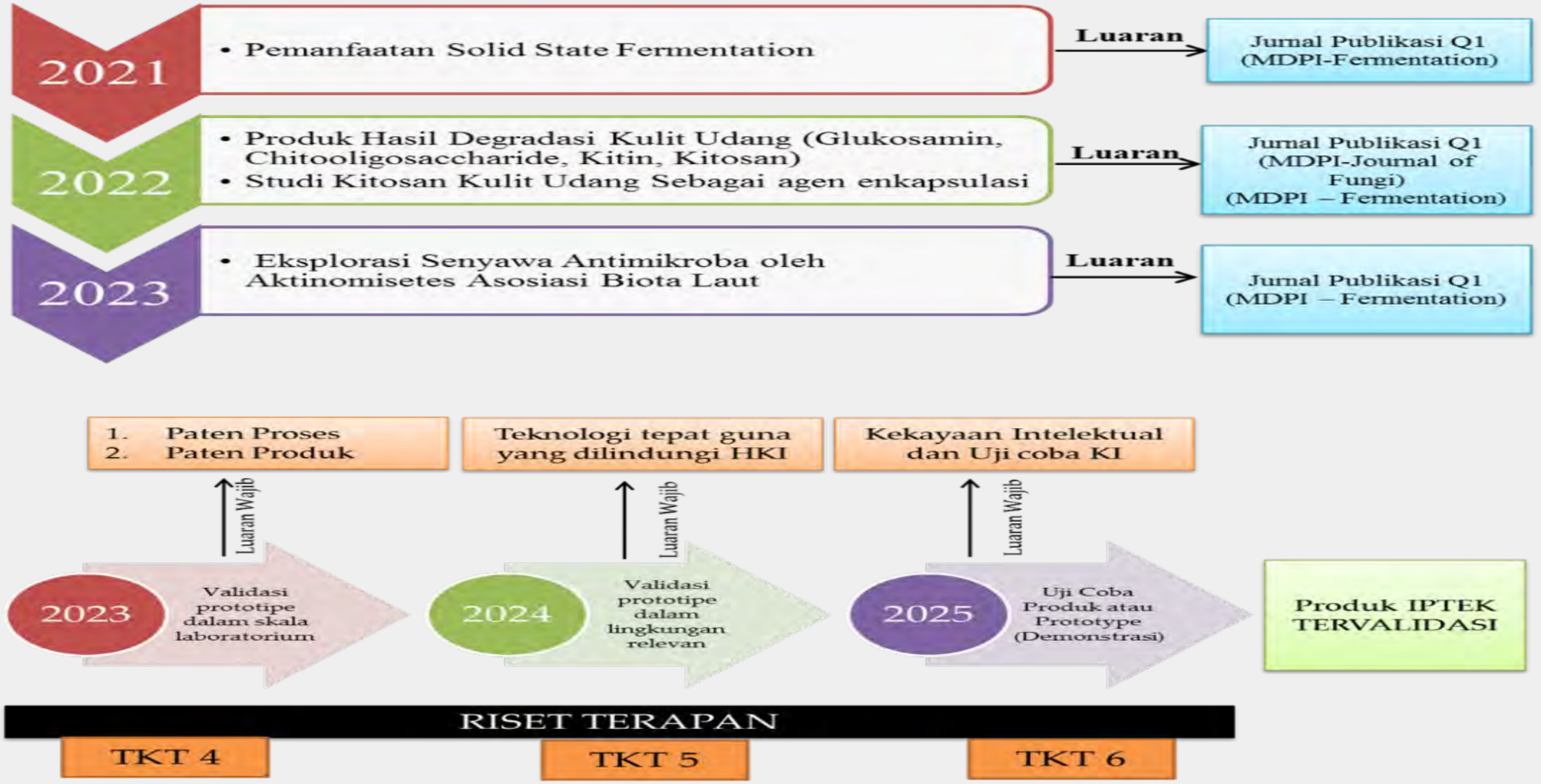
point-point tujuan Riset/Project.(Signifikan)

Tujuan Project Penelitian ini adalah Pembuatan Anti-mikroorganisme (sebagai hama) dari Kelapa Sawit berbasis Kitosan :

1. Pembuatan matriks kitosan dan turuanannya dari 2 sumber yaitu kulit udang dan hasil isolasi fungi dari biota laut sebagai penghasil kitosan
2. Senyawa *secondary metabolic* dari proses cultivasi kulit udang dan cultivasi fungi
3. Uji bioaktifitas turunan kitosan (COS) hasil degradasi kulit udang dan Uji biokatifitas dari senyawa metabolik untuk anti-mikroba dari hama tumbuhan Kelapa Sawit
4. Penentuan struktur dari senyawa metabolik

JUSTIFIKASI RISET/PROJECT

Hasil - hasil Riset/Project sebelumnya yang dilakukan orang lain dan posisi kita di depan melakukan Riset/Project seperti apa.



JUSTIFIKASI RISET/PROJECT- (LANJUTAN)

fermentation

MDPI

Article

Antifungal Agent Chitooligosaccharides Derived from Solid-State Fermentation of Shrimp Shell Waste by *Pseudonocardia antitumoralis* 18D36-A1

Widyastuti Widyastuti [1], Fendi Setiawan [2], Chasya Al Afandy [2], Arik Irawan [2], Aspita Laila [2], Ni Luh Gede Ratna Juliasih [2], Wawan Abdullah Setiawan [3], Masayoshi Arai [4], John Hendri [2] and Andi Setiawan [2,*]

fermentation

MDPI

Article

Solid State Fermentation of Shrimp Shell Waste Using *Pseudonocardia carboxydivorans* 18A13O1 to Produce Bioactive Metabolites

Andi Setiawan [1], Widyastuti Widyastuti [1], Arik Irawan [1], Oklis Syahrin Wijaya [1], Aspita Laila [1], Wawan Abdullah Setiawan [2], Ni Luh Gede Ratna Juliasih [1], Kenichi Nonaka [3], Masayoshi Arai [4] and John Hendri [1,*]

Journal of *Fungi*

MDPI

Article

Fungicide Activity of Culture Extract from *Kocuria palustris* 19C38A1 against *Fusarium oxysporum*

Andi Setiawan [1], Fendi Setiawan [1], Ni Luh Gede Ratna Juliasih [1], Widyastuti Widyastuti [1], Aspita Laila [1], Wawan A. Setiawan [2], Fernandy M. Djailani [3], Mulyono Mulyono [1], John Hendri [1,*] and Masayoshi Arai [4,*]

fermentation

MDPI

Article

Exploration and Biorefinery Antimicrobial Agent Through Solid State Fermentation from Indonesia's Marine Actinomycetes

Aspita Laila [1], Fendi Setiawan [1], Widyastuti Widyastuti [1], M. Rizky Fadhilah [1], Andi Setiawan [1], Ni Luh Gede Ratna Juliasih [1],Wawan A. Setiawan [2], Ety Apriliana [3], Peni Ahmadi [4], Masayoshi Arai [5], and John Hendri[1,*]

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- [2] Doctoral Program Faculty of Science, Lampung University, Bandar Lampung 35145, Indonesia; wawan.as@fmipa.unila.ac.id (W.A.S)
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- [4] Research Center for Vaccine and Drug, Research Organization for Health, National Research and Innovation (BRIN), Jl Raya Bogor Km. 46, Cibinong 16911, Indonesia peni.ahmadi@brin.go.id (P.A)
- [5] Graduate School of Pharmaceutical Sciences, Osaka University, 1-6 Yamada oka, Suita, Osaka 565-0871, Japan; araim@phs.osaka-u.ac.jp (M.A)
- * Correspondence: john.hendri@fmipa.unila.ac.id (J.H); Tel.: +62-812-7927-379

JUSTIFIKASI RISET/PROJECT- (LANJUTAN)

Antibacterial activity of EtOAc extract from marine-derived fungus *Aspergillus nomiae* A12-RF against clinical pathogen bacteria, *Staphylococcus aureus*

[1]Andi Setiawan, [1]Rosyidatul Lutfiah, [1]Ni L. G. R. Juliasih, [2]Wawan A. Setiawan, [1]John Hendri, [3]Masayoshi Arai

[1] Department of Chemistry, Faculty of Mathematics and Natural Sciences, Lampung University, Bandar Lampung, Indonesia; [2] Department of Biology, Faculty of Mathematics and Natural Sciences, Lampung University, Bandar Lampung, Indonesia; [3] Graduate School of Pharmaceutical Sciences, Osaka University, Suita, Osaka, Japan. Corresponding author: A. Setiawan, andi.setiawan@fmipa.unila.ac.id

Abstract. Sponge-derived fungi are a potential source for obtaining bioactive secondary metabolites. The aim of the study was to evaluate the ***in vitro*** antibacterial activity extract from sponge-derived fungi that could inhibit clinical pathogenic bacteria. In this study, nine isolated fungi were selected from deposite of Integrated Laboratory of Innovation and Technology Center, Lampung University. All isolates were maintained in malt extract media. Based on phylogenetic sequencing results, isolate 18A12RF was ***Aspergillus nomius*** (603 bp) using ITS1-5.8-ITS2. The isolate A12RF was cultivated and co-cultivated on rice solid media in 4 L Erlenmeyer flask to obtain 4.2 g of ethyl acetate extract (EtOAc). After that, the extract was subjected to several chromatographic steps based on bioassay-guided separation. The results of the fractionation of 2.4 g of EtOAc extract obtained 33.8 mg of the active fraction of A12RFBF3. The minimum inhibition concentration (MIC) test for the A12RFBF3 fraction showed inhibition of the growth of clinical bacteria ***Staphylococcus aureus*** at a concentration of 6.25 µg mL^{-1}. The findings of this study concluded that the crude extract prepared from the A12RF has antibacterial properties against clinical bacteria. This study is an important work as initial information for further studies in the search for new bioactive compounds.

Key Words: antibacterial agent, ***Aspergillus nomiae***, bacterial pathogen, marine fungi.

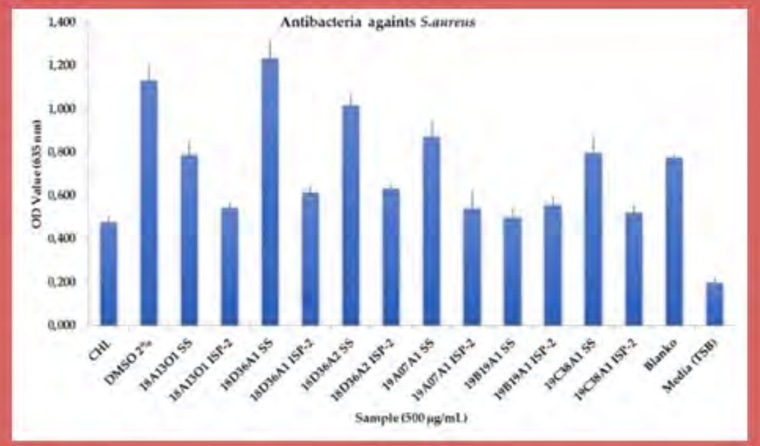
Antibacterial activity of nano chitosan derived from mangrove fungus endophyte, *Fusarium* sp. 20CB07

[1]Siti Aisah, [2]Ridho Nahrowi, [2]Wawan A. Setiawan, [2]Fendi Setiawan, [1]Mulyono Mulyono, [1]Ni L. G. R. Juliasih, [1]John Hendri, [1]Suripto D. Yuwono, [1]Andi Setiawan

[1] Department of Chemistry, Faculty of Mathematics and Sciences, Lampung University, 31545 Bandar Lampung, Indonesia; [2] Doctoral Program, Faculty of Mathematics and Sciences, Lampung University, 31545 Bandar Lampung, Indonesia. Corresponding author: A. Setiawan, andi.setiawan@fmipa.unila.ac.id

JUSTIFIKASI RISET/PROJECT- (LANJUTAN)

Skrining Aktivitas Antibakteri dan Antijamur



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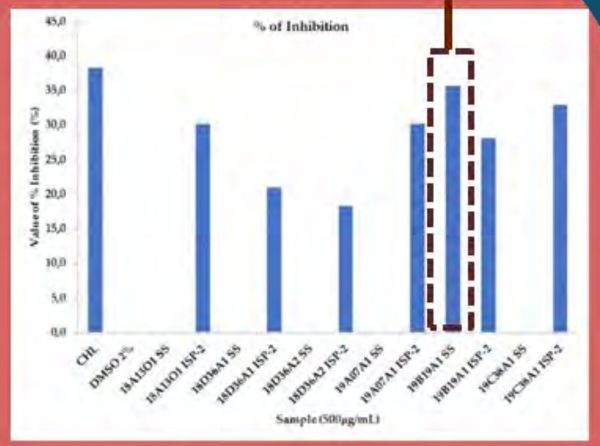

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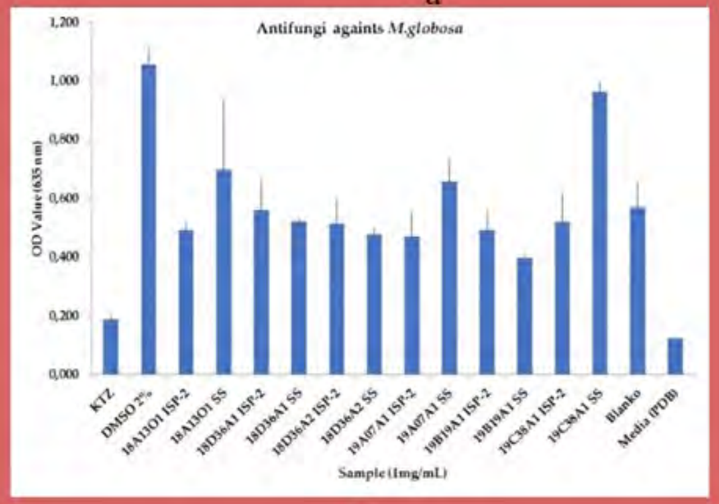

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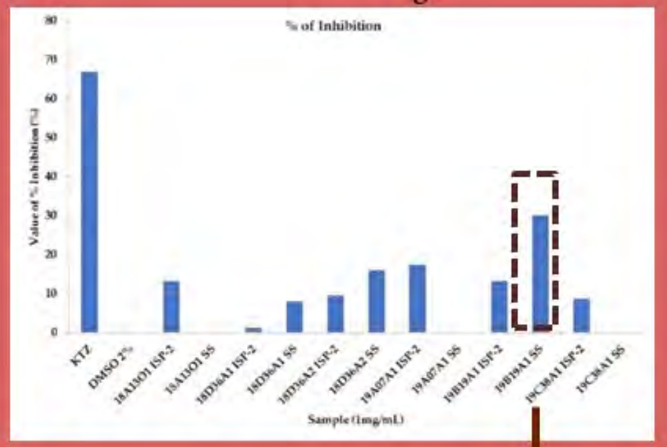


d

antibakteri

Ekstrak EtOAc isolat 19B19A1 (1 mg/mL) yang dikultivasi pada media kulit udang memiliki potensi sebagai agen antibakteri dan antijamur (35,7% dan 30%).

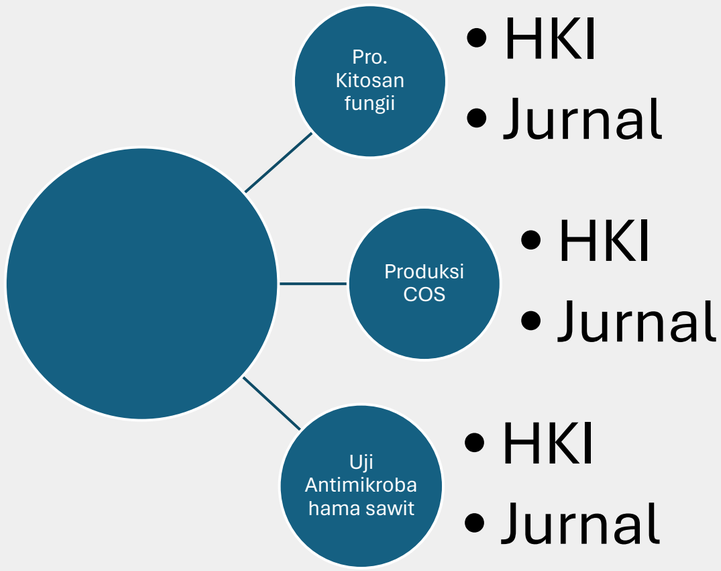
antijamur

BIG PICTURE RISET/PROJECT

2020-2023 → 2024 → 2025 s/d 2026

Hasil Riset dari tahun 2020 s/d 2023

1. 7 publikasi international Q1, Q2 dan Q3
2. 2 Patent yg sdh terdaftar
3. 1 prototype SmF untuk produksi kitosan fungi



Produksi Anti-mikroba & Uji Lapangan → Pembuatan Proses bisnis → Implementasi busnis

BIG PICTURE RISET/PROJECT

FLOWCHART PENELITIAN TAHUN 2024

Mai Juni

Persiapan Penelitian, Rancangan SSF, Uji Pendahuluan

Juni - Juli

Uji Anti-Mikroba hama Sawit

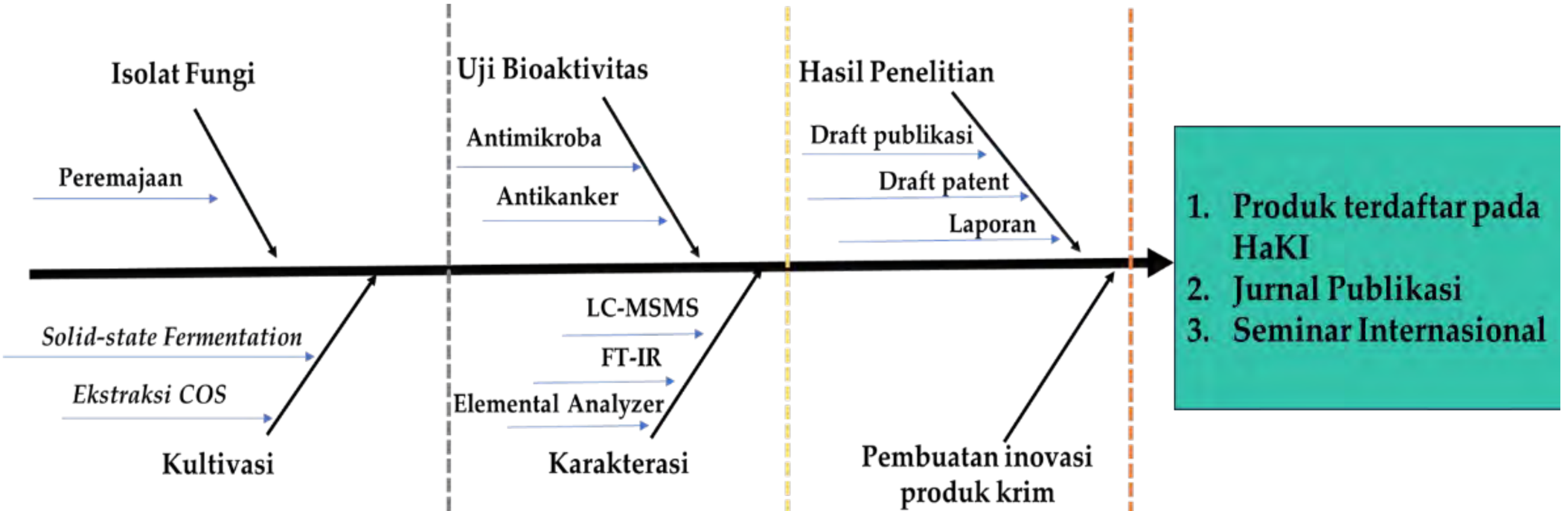
Juli- Agustus

Scale up Production

Sept. - Okto

Draft Laporan, Patent dan Jurnal

BIG PICTURE RISET/PROJECT



Bulan Ke 1-2

- Validasi Komponen COS
- Uji skala laboratorium prototipe yang telah dilakukan

Bulan Ke 3-4

- Prototipe COS untuk bahan krim telah dibuat

Bulan Ke 4-6

- Bioaktif sebagai antimikroba dan antikanker
- Percobaan laboratorium sebagai dasar bahwa komponen tersebut dapat digunakan sebagai produk yang dapat dilindungi oleh HAKI

GANTT CHART PELAKSANAAN

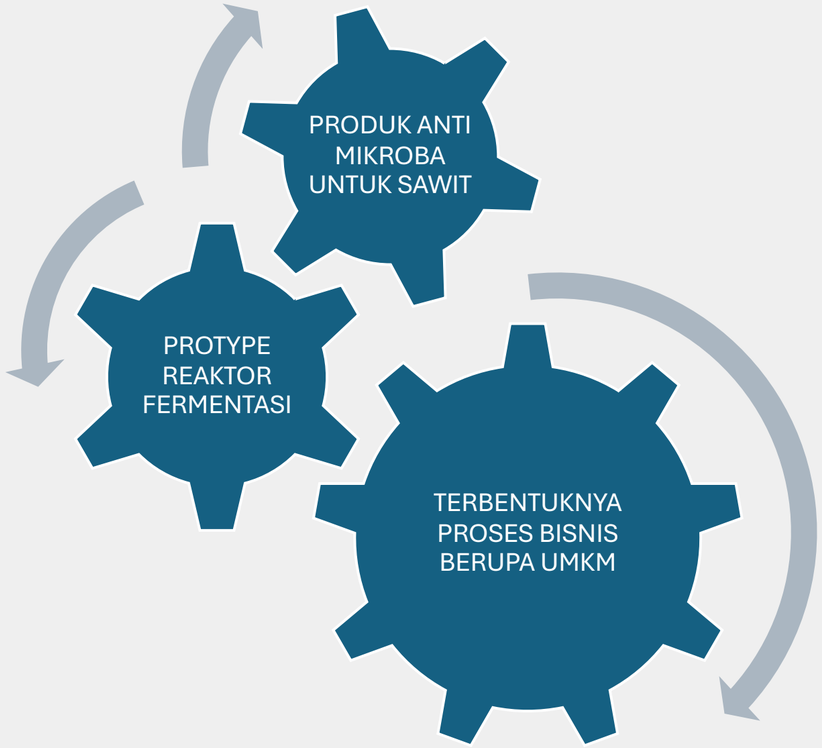
Activity	2024							
	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Pengajuan proposal grant dan koordinasi dengan seluruh tim penelitian-persiapan implementasi grant								
Isolasi fungi dan peremajaan								
Solid State fermentation, ekstraksi COS dan kultivasi								
Karakterisasi Produk: LC-MS, Elemental Analysis, FTIR, SEM-EDX								
[***Skala Lab***] Uji Bioaktivitas sebagai antimikroba hama kelapa sawit di Laboratorium								
[***Skala Mini-Lapangan***]Uji Bioaktivitas sebagai antimikroba hama kelapa sawit di Laboratorium								
Pembuatan/Inovasi Produk Antimikroba hama kelapa sawit								
Penulisan laporan antara (hasil penelitian) dan penyunan draft untuk publikasi ilmiah								
Pengembangan produk untuk capaian Hak atas Kekayaan Intelektual (HaKI)								
Melaksanakan diseminasi hasil penelitian melalui seminar internasional								
Penulisan laporak akhir *project*								

RAB RISET/PROJECT (BIAYA, MPP, ALAT DAN BAHAN)

No.	Rincian	QTY	Harga (Rp Juta)	Total (Rp Juta)
1	Honorarium			
	Ketua Angota Analist (laboran)	1 3 2	15 5 2,5	15 15 5
2	Biaya Bahan Habis Pakai			125
3	Biaya Jasa	1	30	30
	Analisa GC/MS MS Analisis LC/MS MS			
4	Transport Akomodasi	1	30	30
	Uji Lapangan Pendahuluan Uji Penerapan Skala Besar			
5	Publikasi/HKI	1	30	30
	Elsiver/MDPI			
Jumlah Total				250

DAMPAK RISET/PROJECT

Mengalisa dampak dari Riset/Project yang dilakukan baik secara financial dan non-financil secara rinci.



Bumitama Gunajaya Agro

THANK YOU