

# GRANTS



Tarikh : 21 Disember 2020

Profesor Madya Dr. Siti Noor Fazliah Binti Mohd Noor  
 Institut Perubatan & Pergigian Termaju  
 Universiti Sains Malaysia

YBrs. Profesor Madya Dr.,

Bahagian Penyelidikan dan Inovasi  
 Division of Research and Innovation  
 Pejabat Pengurusan dan Kreativiti Penyelidikan  
 Research Creativity and Management Office

Canselori II

Aras 2, Canselori II, Bangunan E42  
 Universiti Sains Malaysia  
 11800 USM Pulau Pinang, Malaysia  
 T : (6)04-653 6527 / 6525  
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 L : www.research.usm.my  
 www.usm.my

## KEPUTUSAN PERMOHONAN SKIM GERAN PENYELIDIKAN PEMBANGUNAN PROTOTAIP (PRGS) 2.0 TAHUN 2020

Dengan segala hormatnya saya merujuk kepada perkara di atas.

2. Tahniah diucapkan di atas kejayaan YBrs. Profesor Madya Dr. memperolehi Geran Penyelidikan Pembangunan Prototaip (PRGS) 2.0 Tahun 2020 di bawah Kementerian Pengajian Tinggi (KPT). Selaras dengan penerimaan peruntukan daripada Jabatan, bersama-sama ini dimajukan butiran penting berkaitan projek beserta nombor akaun untuk rujukan dan tindakan oleh pihak YBrs. Profesor Madya Dr..

Ketua Projek	Profesor Madya Dr. Siti Noor Fazliah Binti Mohd Noor	PTJ	Institut Perubatan & Pergigian Termaju
Penyelidik bersama	1. Prof. Madya Ir. Ts. Dr. Zuratul Ain Abdul Hamid 2. Profesor Dr. Ahmad Sukari Bin Halim 3. Dr. Muhammad Azrul Bin Zabidi 4. Profesor Dr. Shaifulizan Bin Ab Rahman 5. Puan Evelyn Wong Su Moi	PTJ	1. Pusat Pengajian Kejuruteraan Bahan Dan Sumber Mineral 2. Pusat Pengajian Sains Perubatan 3. Institut Perubatan & Pergigian Termaju 4. Pusat Pengajian Sains Pergigian 5. Progene Link Sdn Bhd
Tajuk Projek	<i>In Vivo Evaluation of Bioglass-Polymer Composite Film Patch for Treatment of Mucosal Ulceration</i>		
No. Akaun	<b>203.CIPPT.6740075</b>	Peruntukan Diluluskan	<b>RM173,600.00</b>
Tempoh Projek	24 bulan		
Tarikh Mula	1 Disember 2020	Tarikh Tamat	30 November 2022
Catatan	<p>- <b>Perbelanjaan Geran Penyelidikan Pembangunan Prototaip (PRGS) 2.0</b> adalah secara kawalan vot. Penyelidik mestilah membuat perancangan dan pebelanjaan mengikut jumlah agihan vot yang diluluskan dan perlu mematuhi prosedur dan peraturan kewangan semasa Universiti. Sebarang permohonan/keperluan untuk pindaan vot perlu mendapat kelulusan RCMO dan dipertimbangkan/dibenarkan <b>setahun sekali sahaja</b>.</p> <p>- Semua pembelian, penempatan, pemantauan dan penyelenggaraan aset/inventori yang diluluskan merupakan <b>hak USM</b> dan tanggungjawab Ketua Penyelidik. Pengurusan dan pengawasannya diletakkan di bawah tanggungjawab PTJ setelah geran tamat. Universiti berhak untuk mengagihkan semula aset/inventori ini jika diperlukan.</p>		

## KEPUTUSAN PERMOHONAN SKIM GERAN PENYELIDIKAN PEMBANGUNAN PROTOTAIP (PRGS) 2.0 TAHUN 2020

3. YBrs. Profesor Madya Dr. perlu memastikan output/hasil penyelidikan projek ini seperti yang dinyatakan/ditetapkan di dalam permohonan yang telah diluluskan oleh Kementerian (*revised proposal*). Butiran adalah seperti berikut:

Output/Hasil Penyelidikan	
Bilangan <i>Minimum Viable Product</i> (MVP)	1
Bilangan Harta Intelek (IP)	4

4. Untuk makluman selepas enam (6) bulan pertama penyelidikan, YBrs. Profesor Madya Dr. perlu menghadiri sesi pembentangan pemantauan untuk menentukan sama ada penyelidikan ini boleh diteruskan atau sebaliknya. Kemudian, **laporan kemajuan perlu dihantar pada setiap enam (6) bulan sekali melalui Sistem MyGRANTS dan laporan akhir dalam tempoh tiga (3) bulan selepas tamat tempoh geran.** Sekiranya YBrs. Profesor Madya Dr. gagal menghantar laporan kemajuan/akhir dalam masa yang ditetapkan, semua akaun geran YBrs. Profesor Madya Dr. yang masih berstatus aktif akan **dibekukan** serta-merta tanpa notifikasi dan hanya akan diaktifkan semula setelah laporan yang berkaitan diterima. Untuk makluman juga, berkemungkinan YBrs. Profesor Madya Dr. akan **disenarai hitam** dan secara tidak langsung akan mempengaruhi peluang YBrs. Profesor Madya Dr. untuk mendapat geran pada masa hadapan.

Sekian, terima kasih.

**“BERKHIDMAT UNTUK NEGARA”**

Saya Yang Menjalankan Amanah,



**(IRNI SYUHADA BINTI IBRAHIM)**

Pegawai Penyelidik


Pejabat Pengurusan & Kreativiti Penyelidikan

s.k. Pengarah  
Pejabat Pengurusan dan Kreativiti Penyelidikan

Pengarah  
Institut Perubatan & Pergigian Termaju  
Universiti Sains Malaysia


Penolong Bendahari Kanan  
Seksyen Kewangan & Penyelidikan  
Jabatan Bendahari

**Perincian Agihan Skim Geran Penyelidikan  
Pembangunan Prototaip (PRGS) 2.0  
Tahun 2020**

Kegunaan Pejabat		
Disediakan oleh	 ( Irni Syuhada Binti Ibrahim )	21.12.2020
Disemak oleh	 ( Irni Syuhada Binti Ibrahim )	21.12.2020

Jumlah Peruntukan yang diluluskan	: RM173,600.00	Ketua Projek	: <b>Profesor Madya Dr. Siti Noor Fazliah Binti Mohd Noor</b> <i>(Institut Perubatan Dan Pergigian Termaju)</i>
Agihan 1	: RM49,600.00	Tajuk Projek	: <b><i>In Vivo Evaluation of Bioglass-Polymer Composite Film Patch for Treatment of Mucosal Ulceration</i></b>
		Penaja	: <b>Kementerian Pengajian Tinggi</b>
		Kluster/NIC	: <b><i>Clinical &amp; Health Sciences</i></b>
		Tempoh Geran	: <b>24 Bulan</b> <b>(1 Disember 2020 – 30 November 2022)</b>
		No. Akaun	: <b>203.CIPPT.6740075</b>

Agihan 1 Projek			
Bil.	Vot USM	Agihan Sub 1 (RM)	Agihan Sub 2 (RM)
1.	11000	13,800.00	13,800.00
2.	14000	-	-
3.	21000	0.00	0.00
4.	22000	-	-
5.	23000	-	-
6.	24000	0.00	3,000.00
7.	26000	-	-
8.	27000	18,000.00	0.00
9.	28000	0.00	0.00
10.	29000	1,000.00	0.00
11.	35000	0.00	0.00
12.	42000	-	-
13.	52000	-	-
<b>JUMLAH DISALURKAN KE AKAUN</b>		<b>32,800.00</b>	<b>16,800.00</b>

Keputusan : <input checked="" type="checkbox"/> LULUS <input type="checkbox"/> TIDAK LULUS	Peralatan yang diluluskan: <b>Tiada</b>
Tandatangan:  <b>PROF. DATO' IR. DR. ABDUL RAHMAN MOHAMED, FASc.</b> Timbalan Naib Canselor Penyelidikan dan Inovasi	
Tarikh : 21 Disember 2020	



MINISTRY OF HIGHER EDUCATION

APPLICATION FORM  
PROTOTYPE DEVELOPMENT RESEARCH GRANT  
SCHEME (PRGS) 2.0 (PRGS)  
*Skim Geran Penyelidikan Pembangunan Prototaip (PRGS) 2.0 Tahun 2020*

JABATAN PENDIDIKAN TINGGI  
KEMENTERIAN PENGAJIAN TINGGI

A. Application Details	
Application ID	383245-389053
Reference Code	PRGS/2/2020/SKK07/USM/02/2
A(i). Selected Grant	PRGS 2.0 (2020)
A(ii). Title of Proposed Research Project	In vivo evaluation of bioglass-polymer composite film patch for treatment of mucosal ulceration
A(iii). Keywords (must include keywords used in the Patent Search)	Bioactive glass composite, Film patch, Ulceration

B. Details of Project Leader	
B(i). Name	<a href="#">Siti Noor Fazliah Binti Mohd Noor</a>
B(ii). Nationality	Malaysia
B(iii). IC/Passport No.	730102015014
B(iv). Position	Associate Professor
B(v). University	Universiti Sains Malaysia (USM)
B(vi). Faculty/Centre	Advance Medical and Dental Institute
B(vii). Unit	Craniofacial and Biomaterials Science Cluster
B(viii). Office Phone No.	045622393 Ext.2393
B(ix). Handphone No.	0133960943
B(x). E-mail Address	fazliah@usm.my
B(xi). Date of first appointment with this University (tarikh lantikan)	01/06/2000
B(xii). Type of Service (Permanent/Contract)	Permanent

C. Research Information	
C(i). Research Domain	
Research Domain	Sub Research Domain
Clinical and Health Sciences	Health Science

Researcher Domain	
Research Domain	Sub Research Domain
Pure and Applied Science	Materials Science
Technology and Engineering	Material and Polymer

**C(ii). Focus Area**

Focus Area: Emergency, Disaster and Pandemic-focused Medical Devices and Health Solutions

**C(iii). Research Cluster**

Cluster: Health and Wellbeing

**C(iv). National Priority Area**

Priority Area: Healthcare and Medicine

**C(v). This Prototype Development Research is a continuation from a previous grant:**

<input checked="" type="checkbox"/>	<b>Other Research Grants:</b>	
	Project Source	Ministry of Science, Technology and Innovation (MOSTI)
	Name of Grant Scheme	ScienceFund
	Percentage of Contribution to This Research (%)	30
	Project Title	<a href="#">Development of bioactive glass scaffold for hard tissue regeneration</a>
	Project Reference No.	02-01-05-SF0786
	Duration and Year Approved	01/11/2015 - 30/10/2018
Project Duration	3 years	
Amount Approved (RM)	241900	
Final Report	<a href="#">eScienceFund Portal - Monendproject Pdf.pdf</a>	
RMC Verification Letter	<a href="#">H0338 TUTUP AKAUN.pdf</a>	
Current Status of the Prototype	Complete	
Project Leader of this Grant	Yes	
<input checked="" type="checkbox"/>	<b>Other Research Grants:</b>	
	Project Source	Universiti Sains Malaysia
	Name of Grant Scheme	Bridging
	Percentage of Contribution to This Research (%)	70
	Project Title	<a href="#">Development of bioactive glass-polymer composite film for treatment of oral ulcers</a>
	Project Reference No.	BG0095
	Duration and Year Approved	25/01/2018 - 24/01/2019
Project Duration	1 year	
Amount Approved (RM)	9964	
Final Report	<a href="#">BORANG LAPORAN AKHIR GERAN BRIDGING 2018-240119.pdf</a>	
RMC Verification Letter	<a href="#">BG0095-surat final report.pdf</a>	
Current Status of the Prototype	Complete	
Project Leader of this		

Project Leader of this Grant	Yes
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### C(vi). Evidence from TTO/ICC/relevant department at Project Leader's home institution on the Technology Readiness Level (TRL) of the existing prototype

[TRL SNFMN.pdf](#)

### C(vii). Location of Research

#### Location

Advanced Medical and Dental Institute, Universiti Sains Malaysia

### C(viii). Duration of this research

From	1/December/2020
To	30/November/2022
Duration	2 years

### C(ix). Other Researchers

Researcher Id	Name	IC / Passport Number	Faculty/ School/ Centre/ Unit	Position	Area of Expertise	Next Appointed Leader	Role
23841	<a href="#">Zuratul Ain Abdul Hamid</a>	780203025030	Universiti Sains Malaysia	Associate Professor (Assoc. Prof. Ir. Ts. Dr.)	Polymeric Biomaterials, Drug Delivery Devices, Tissue Engineering	<input type="checkbox"/>	Expertise in biocompatible polymer materials
31528	<a href="#">Ahmad Sukari Bin Halim</a>	610404025019	Universiti Sains Malaysia	Professor (Professor)	Reconstructive Microsurgery	<input type="checkbox"/>	Expertise in skin grafts and plastic surgeries
70776	<a href="#">Muhammad Azrul Bin Zabidi</a>	840405025751	Universiti Sains Malaysia	Senior Lecturer (UNIVERSITY LECTURER)	Polymer Based Nanocarrier	<input checked="" type="checkbox"/>	Expertise in polymeric materials and interactions
104405	<a href="#">Shaifulizan Bin Ab Rahman</a>	700605035693	Universiti Sains Malaysia	Professor (Dr.)	implantology, head and neck oncology, trauma	<input type="checkbox"/>	Expertise in oral surgeries and trauma
116070	<a href="#">Evelyn Wong Su Moi</a>	600804055082	PROGENE LINK SDN BHD	Others (R&D DIRECTOR)		<input type="checkbox"/>	Expertise in material designing and marketing strategy

### C(x). Research projects that have been completed or ongoing by researchers related to the proposed prototype development project.

Title	Grant Name	Role	Progress (%)	Status	Duration	Start Date	End Date
Development and Characterization of Novel Zirconiacalcia-(ZrCaO <sub>3</sub> )-Bioglass for Dental Application	Research University (RUI) Grant Scheme	Member	N/A	In Progress	3 years 6 months	01/06/2020	30/11/2023
Parental Perception Towards Utilization of General Dental Anaesthesia Among Children	Research University (RUI) Grant Scheme	Member	N/A	In Progress	3 years 6 months	01/01/2020	30/06/2023
Study on Interaction between Polymer Based Artificial Blood with Human Vascular Endothelial Cells	FRGS	Member	0	In Progress	3 years 3 months	01/09/2019	30/11/2022

Ruj. Kami : VO0075  
Tarikh : 6 Disember 2021

Puan Syarifah Zurina Binti Syed Salim  
Penolong Bendahari Kanan  
Seksyen Kewangan Penyelidikan  
Jabatan Bendahari

Puan,

**PERMOHONAN PENYALURAN PERUNTUKAN AGIHAN TAHUN KEDUA SUB PERTAMA BAGI SKIM GERAN PENYELIDIKAN PEMBANGUNAN PROTOTAIP (PRGS) 2.0**

Dengan segala hormatnya saya merujuk kepada perkara di atas.

2. Dimaklumkan bahawa penyelidik Geran Pembangunan Prototaip (PRGS) 2.0 seperti yang dilampirkan adalah layak untuk menerima peruntukan bagi tahun kedua sub pertama berjumlah **RM124,000.00**. Selanjutnya dimohon kerjasama Puan untuk mengambil tindakan sewajarnya. (Sila rujuk lampiran agihan berkenaan)

3. Kerjasama dari pihak Puan amatlah dihargai dan saya akhiri dengan ucapan terima kasih.

Sekian, terima kasih.

**"WAWASAN KEMAKMURAN BERSAMA 2030"**  
**"BERKHIDMAT UNTUK NEGARA"**  
Saya Yang Menjalankan Amanah

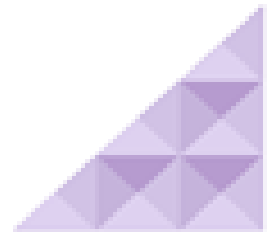
**IRNI SYUHADA BINTI IBRAHIM**

Pegawai Penyelidik  
Pejabat Pengurusan & Kreativiti Penyelidikan

s.k. Pengarah  
Pejabat Pengurusan & Kreativiti Penyelidikan



Pengarah  
Institut Perubatan Dan Pergigian Termaju

Prof. Madya Dr. Siti Noor Fazliah Binti Mohd Noor  
Institut Perubatan dan Pergigian Termaju






**Perincian Agihan Skim Geran Penyelidikan  
Pembangunan Prototaip (PRGS) 2.0  
Tahun 2020**

Kegunaan Pejabat		
Disediakan oleh	 (Nur Anati Amirah Bt Mohd Kamal)	02.12.2021
Disemak oleh	 (Irm Syuhada Bt Ibrahim)	02.12.2021

Jumlah Peruntukan yang diluluskan	: RM173,600.00	Ketua Projek	: <b>Profesor Madya Dr. Siti Noor Fazliah Binti Mohd Noor</b> <i>(Institut Perubatan Dan Pergigian Termaju)</i>
Agihan 2	: RM124,000.00	Tajuk Projek	: <b><i>In Vivo Evaluation of Bioglass-Polymer Composite Film Patch for Treatment of Mucosal Ulceration</i></b>
		Penaja	: <b>Kementerian Pengajian Tinggi</b>
		Kluster/NIC	: <b><i>Clinical &amp; Health Sciences</i></b>
		Tempoh Geran	: <b>24 Bulan</b> <b>(1 Disember 2020 – 30 November 2022)</b>
		No. Akaun	: <b>203.CIPPT.6740075</b>

**Agihan 2 Projek**

Bil.	Vot USM	Agihan Sub 1 (RM)	Agihan Sub 2 (RM)
1.	11000	11,500.00	0.00
2.	14000	-	-
3.	21000	20,000.00	0.00
4.	22000	-	-
5.	23000	-	-
6.	24000	7,000.00	0.00
7.	26000	-	-
8.	27000	43,000.00	0.00
9.	28000	6,000.00	0.00
10.	29000	36,500.00	0.00
11.	35000	0.00	0.00
12.	42000	-	-
13.	52000	-	-
	<b>JUMLAH DISALURKAN KE AKAUN</b>	<b>124,000.00</b>	<b>0.00</b>

Keputusan : <input checked="" type="checkbox"/> LULUS <input type="checkbox"/> TIDAK LULUS	Peralatan yang diluluskan: Tiada
Tandatangan:  <b>PROF. DATO' IR. DR. ABDUL RAHMAN BIN MOHAMED, FASc.</b> Timbalan Naib Canselor Penyelidikan dan Inovasi	
Tarikh : <u>6/12/2021</u>	

Tarikh : 3 Mac 2021

Profesor Madya Dr. Siti Noor Fazliah Binti Mohd Noor  
 Institut Perubatan & Pergigian Termaju  
 Universiti Sains Malaysia

YBrs. Profesor Madya Dr.,

**PENGAKTIFAN SEMULA SKIM GERAN PENYELIDIKAN PEMBANGUNAN PROTOTAIP (PRGS) 2.0 TAHUN 2020**

Dengan segala hormatnya saya merujuk kepada perkara di atas.

2. Untuk makluman YBrs. Dr., akaun Geran PRGS YBrs. Dr. seperti mana perincian di bawah telah **diaktifkan semula** berkuatkuasa pada **3 Mac 2021** berikutan penerimaan surat kelulusan dari Jawatankuasa Etika USM bertarikh 3 Mac 2021.

Ketua Projek	Profesor Madya Dr. Siti Noor Fazliah Binti Mohd Noor	PTJ	Institut Perubatan & Pergigian Termaju
Penyelidik bersama	1. Prof. Madya Ir. Ts. Dr. Zuratul Ain Abdul Hamid 2. Profesor Dr. Ahmad Sukari Bin Halim 3. Dr. Muhammad Azrul Bin Zabidi 4. Profesor Dr. Shaifulizan Bin Ab Rahman 5. Puan Evelyn Wong Su Moi	PTJ	1. Pusat Pengajian Kejuruteraan Bahan Dan Sumber Mineral 2. Pusat Pengajian Sains Perubatan 3. Institut Perubatan & Pergigian Termaju 4. Pusat Pengajian Sains Pergigian 5. Progene Link Sdn Bhd
Tajuk Projek	<i>In Vivo Evaluation of Bioglass-Polymer Composite Film Patch for Treatment of Mucosal Ulceration</i>		
No. Akaun	<b>203.CIPPT.6740075</b>	Peruntukan Diluluskan	<b>RM173,600.00</b>
Tarikh Mula	1 Disember 2020	Tarikh Tamat	30 November 2022

3. Berikutan itu, YBrs. Dr. boleh menjalankan penyelidikan seperti yang telah diperakui oleh pihak Kementerian.

Sekian, terima kasih.

**“PRIHATIN RAKYAT: DARURAT MEMERANGI COVID-19”**  
**“BERKHIDMAT UNTUK NEGARA”**

Saya Yang Menjalankan Amanah,

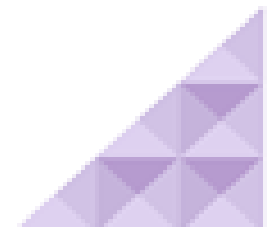


**(IRNI SYUHADA BINTI IBRAHIM)**

Pegawai Penyelidik  
 Pejabat Pengurusan & Kreativiti Penyelidikan

s.k. Pengarah  
 Institut Perubatan & Pergigian Termaju

Penolong Bendahari Kanan  
 Seksyen Kewangan & Penyelidikan  
 Jabatan Bendahari



**MOA**





## **RESEARCH COLLABORATION AGREEMENT**

**BETWEEN**

**UNIVERSITI SAINS MALAYSIA**

**AND**

**PROGENE LINK SDN BHD**

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*RESEARCH COLLABORATION ON IN VIVO ASSESSMENT OF BIOACTIVE GLASS-POLYMER  
COMPOSITE FILM PATCH FOR TREATMENT OF MUCOSAL ULCERATION*

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## RESEARCH COLLABORATION AGREEMENT



THIS RESEARCH COLLABORATION AGREEMENT is made this 17 day of FEBRUARY 2021 (hereinafter referred to as "Agreement");

### BETWEEN

**UNIVERSITI SAINS MALAYSIA**, a public institution of higher learning established under the Universities and University Colleges Act 1971, which for the purpose of this Agreement is represented by its Advanced Medical and Dental Institute, with its main campus at 11800 USM, Pulau Pinang, Malaysia (hereinafter referred to as "USM") of the first part;

### AND

**PROGENE LINK SDN BHD (Company no. 591013-H)**, a company incorporated and existing under the laws of Malaysia and having its business address at 21-1, Jalan USJ 1/33, USJ 1, 47620 Subang Jaya, Selangor, Malaysia (hereinafter referred to as "PROGENE") of the second part.

(USM and PROGENE shall hereinafter be collectively referred to as "Parties" and individually as "Party", where the context so requires)

### WHEREAS

- A. USM is Malaysia's premier research university which strives to enhance and strengthen its educational programs and has taken various initiatives to complement its educational excellence. With its research and teaching facilities, experience, and a multi-disciplinary team of experts from among its staff members, USM has entered into various collaborative arrangements with other parties in its efforts to enhance its research content and strengthen its industrial networking.
- B. PROGENE is a small-medium enterprise company established in 2002 with experience in dealing with fabrication of patch films via electrospinning method. The company's strength is aligned with the interest of an advanced research institution like AMDI, USM that is well equipped to provide relevant expertise and services in biomaterial prototyping and animal testing.
- C. USM and PROGENE are of the view that there are synergistic benefits to be derived for the Parties in this collaboration through sharing and further developing the knowledge and expertise of both Parties in relation to the Project (as hereinafter defined).
- D. USM and PROGENE are desirous of formalizing this research collaboration by entering into this Agreement subject to the terms and conditions as stipulated herein.

IN WITNESS WHEREOF the Parties hereto have caused this Agreement to be signed on the day and year first above written.

SIGNED BY  
For and on behalf of

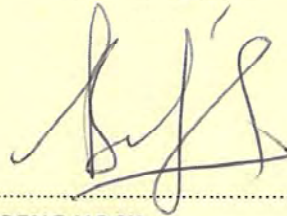
UNIVERSITI SAINS MALAYSIA



PROFESSOR DR. FAISAL RAFIQ MAHAMD  
ADIKAN, FASc  
Vice-Chancellor

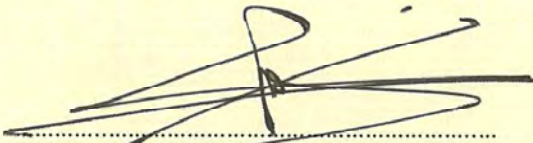
SIGNED BY  
For and on behalf of

PROGENE LINK SDN BHD



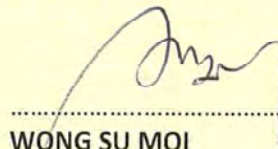
LIM BENG HOCK  
General Manager

WITNESSED BY:



PROFESOR DR. SYED AZHAR SYED SULAIMAN  
Director  
Advanced Medical and Dental Institute

WITNESSED BY:



WONG SU MOI  
Director

**ORIGINAL**

**PERJANJIAN KERJASAMA**

ANTARA

**KERAJAAN MALAYSIA  
(DIWAKILI OLEH AGENSI NUKLEAR MALAYSIA)**

DENGAN

**UNIVERSITI SAINS MALAYSIA**



KERAJAAN MALAYSIA

**IBU PEJABAT**  
**LEMBAGA HASIL DALAM NEGERI MALAYSIA**  
**MENARA HASIL**  
**PERSIARAN RIMBA PERMAI**  
**CYBER 8, 63000 CYBERJAYA**  
**SELANGOR DARUL EHSAN**

**SIJIL SETEM**

ASAL

**STAMP CERTIFICATE**



(Sila lekatkan sijil setem ini ke atas surat cara sebagai bukti penyeteman)  
 Please attach this stamp certificate to the instrument as evidence of stamping

**Cara Bayaran** *Payment Method* FPX TRANSACTIONS  
**No. Adjudikasi** *Adjudication No.* G01C570DF1XP009  
**Jenis Surat Cara** *Type Of Instrument* PERJANJIAN KERJASAMA  
 SURAT CARA UTAMA  
**Tarikh Surat Cara** *Date Of Instrument* 12/05/2022  
**Balasan** *Consideration* RM 0.00  
**Maklumat Pihak Pertama / Penjual / Pemberi** *First Party / Vendor / Transferor / Assignor*  
 AGENSI NUKLEAR MALAYSIA, NO SYARIKAT 00000000  
**Maklumat Pihak Kedua / Pembeli / Penerima** *Second Party / Purchaser / Transferee / Assignee*  
 UNIVERSITI SAINS MALAYSIA, NO SYARIKAT 00000000  
**Butiran Harta / Suratcara** *Property / Instrument Description*

LHDN  
 MALAYSIA

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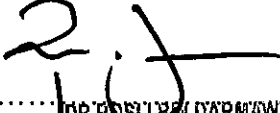
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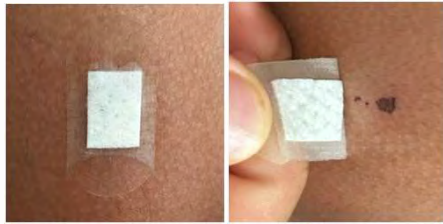


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## Our Team Members



**Non-resorbable patch**



**LEG ULLER MANAGEMENT**  
**Nursing Times**

**DISCUSSION**  
**How can we reduce the environmental impact of wound management?**

01 AUGUST 2022  
The National Wound Care Strategy Programme's recommendations aim to improve sustainability and reduce carbon emissions.

Waste Management & Research  
Volume 19, Issue 1, April, June 2021, Pages 18-26  
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https://doi.org/10.1177/0734242201991911



Open Access Supplement Article

**Clinical waste management under COVID-19 scenario in Malaysia**

P. Agamuthu<sup>1</sup> and Jayanthi Barasathri<sup>2</sup>

**Abstract**  
Malaysia recorded 8904 coronavirus disease (COVID-19) cases and 124 deaths as of 27 July 2020. Globally, everyday there are thousands of new cases of COVID-19 being recorded. Due to the high number of infections globally and nationwide the increase in the amount of clinical waste (CW) generation was expected. Malaysia has reported a 27% (by weight) increase in the generation of CW which was mostly attributed to COVID-19 related waste. This article presents the impacts of COVID-19 on waste generation, policy and regulation of CW management (CCM) in Malaysia and a case study on the CCM at a selected hospital used as a COVID-19 focal point. The current practice of CCM due to COVID-19 related cases follows the existing policy and legislation of CCM detailed in the Schedule Waste Regulation (2005), Environmental Quality Act, 1974, and with the standard operating procedure provided by the Ministry of Health, Malaysia. The case study conducted through survey and questionnaire interviews revealed that the CCM in government hospitals followed existing guidelines for CCM for COVID-19 waste, with some additional precautions and rules by the waste management contractors.



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**Clinical waste shot up by 43.8%**

FOCUS  
Sunday, 24 Apr 2022

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**Frontiers in Water and Environment**

**Overview of Clinical Waste Management in Malaysia**  
Thina Chai YL, Muhammad Nur Harwan Joshi  
Department of Civil Construction Engineering, Faculty of Engineering, Universiti Teknikal Malaysia Melaka, Melaka, Malaysia  
\*Correspondence: an.harwan@utem.edu.my

RECEIVED: 17 April 2021; REVISED: 7 May 2021; ACCEPTED: 9 May 2021

**ABSTRACT:** Clinical waste management system in Malaysia was established in 1989 after the emergence of HIV. Ministry of Health of Malaysia and the Department of Environment Malaysia have revised the current policies and guidelines to control infectious disease and handling clinical waste. The clinical waste management services are managed by private contractors under the supervision of the government according to the Schedule Waste Regulation 2005. The disposal method through incineration process turns the clinical waste into ash and disposed of at the approved landfill site. Malaysia also practicing recycling and recovery of non-infectious clinical waste to reduce the cost and minimize waste generation. However, clinical waste management became an issue due to the outbreak of COVID-19 in December 2019 posing a serious impact on all parts of society. The waste generated sharply increased with the quantity demanded disposal gloves, face masks, etc. in the hospital, increase clinical waste density, the pathogen effectively, reduce the chance of transmission disease and yet potentially releasing secondary pollutants of gas emission and required landfill site for final disposal. Landfilling is not a sustainable and long-term solution because of the toxic leachate and greenhouse gas emissions as well as the limited land in the future.  
**KEYWORDS:** Environmental pollution; waste management; clinical waste; incineration; landfilling



Splashed amount: Covid-19 clinical waste collected from healthcare facilities include those from vaccination centres like the Sunway Pyramid Convention Centre PPV - UZZRAFQ ALIAS/The Star

WE are moving towards endemicity now, but the trail of clinical waste left behind during the Covid-19 pandemic continues to heap up.





Difficulty in finding resorbable product while at the same time able to regenerate tissue



**PROBLEM STATEMENT**

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CONTACT DERMATITIS

Review Article

**Allergic contact dermatitis from modified colophonium in wound dressings**

TERESA M. PEREIRA<sup>1</sup>, MARIA FLORES<sup>2</sup> AND AN GOOSSENS<sup>2</sup>

<sup>1</sup>Servico de Dermatologia e Venereologia, Hospital de São Marcos, Braga, Portugal, and <sup>2</sup>Department of Dermatology, Katholieke Universiteit Leuven, 3000 Leuven, Belgium

This study concerns a 69-year-old female patient with a longstanding history of venous ulcers on both lower legs and multiple sensitivities, who developed excruciating lesions with the hydrocolloid dressing CombiDerm® (Convasec Ltd., a Bristol-Myers Squibb division, Ishikawa, Midatlantic, UK). Epicutaneous tests were positive to this dressing and to a modified colophonium derivative, i.e. glyceryl rosinate, however not to the unmodified colophonium from the standard series. A review of the literature showed several case reports about sensitization to similar hydrocolloids being distributed under various brand names in different countries and which contain the posterythral ester of the hydrogenated rosin as the tackifying agent. Some of the patients described did, while others did not, react to colophonium but only to a modified derivative. In our patient, the reaction to glyceryl rosinate most probably represent cross-sensitivity with the modified colophonium derivative used in CombiDerm®; the precise but not the exact nature of which was observed by the company. In patients where allergic contact dermatitis from hydrocolloid dressings is strongly suspected and colophonium tests negatively, patch testing to modified colophonium derivatives should therefore be performed. As the complete composition of wound dressings is most often unknown, we urgently advocate legal requirements for labelling of these and in fact all medically used devices.

**Key words:** allergic contact dermatitis, colophonium, glyceryl rosinate, leg ulcer, modified colophonium, patch test, rosin, treatment, wound dressings. © Blackwell Munksgaard 2007.

Accepted for publication 29 September 2006.

Received 21 January 2021 | Revised and accepted 3 May 2021  
DOI: 10.1111/ced.14284

**ORIGINAL ARTICLE**

**Allergic contact dermatitis caused by acrylic-based medical dressings and adhesives**

Lien Mestach | Sara Huygens | An Goossens | Liesbeth Gilissen

Department of Dermatology, University Hospital KU Leuven, Leuven, Belgium  
Correspondence: Professor An Goossens, Contact Allergy Unit, Department of Dermatology, University Hospital KU Leuven, Kasernedreef 35 B, 3000 Leuven, Belgium.  
Email: an.goossens@kuleuven.be

**Background:** Acrylates and methacrylates are acrylic resin monomers that are known to induce skin sensitization as a result of their presence in different materials, such as nail cosmetics, dental materials, printing inks, and adhesives. Allergic contact dermatitis resulting from the use of modern wound dressings containing them has only rarely been reported.

**Objectives:** To describe 2 patients who developed allergic contact dermatitis caused by acrylic-based modern medical dressings and/or adhesives.

**Methods:** The medical charts of patients consulted since 1990 were retrospectively reviewed.

PubMed.gov

Advanced

Case Reports | Pediatr Dermatol 2020; May;37(3):510-511. doi: 10.1111/pde.14084.  
Epub 2020 Jan 24.

**Allergic contact dermatitis caused by wound closure tape in a pediatric patient**

Idy Tam<sup>1</sup>, JiaDe Yu<sup>2</sup>

Affiliations + expand  
PMID: 31975451 DOI: 10.1111/pde.14084

**Abstract**

Wound care products are emerging as causes of allergic contact dermatitis (ACD). There are increasing reports of ACD to certain medical adhesives; however, there are no published reports of contact sensitization solely due to wound closure tape such as Steri-Strips™. Herein, we present the first confirmed case of ACD in a child caused by wound closure tape.

**Keywords:** acrylates; adhesives; allergic contact dermatitis; patch testing; wound closure tape; wound dressing.

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**Clinical waste has reportedly increased by 27% since Covid-19**



Image from The Star

Before we get into the other stuff, let's start with **what's clinical waste?**

**Clinical waste** is ultimately scraps that come from healthcare activities or within a laboratory, and can potentially threaten human health or even the environment if exposed. The waste can include things like syringes, bandages, gloves, blood bags, organs, and personal protective equipment (PPE), as long as they



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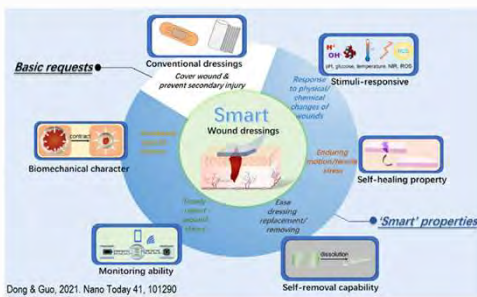
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Spilled amount: Covid-19 clinical waste collected from healthcare facilities include those from vaccination centres like the Sunway Pyramid Convention Centre PAV - IZZAFIQ ALIAS/The Star

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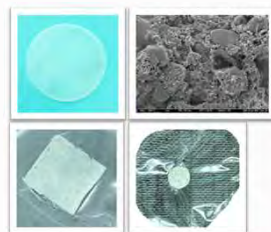


Dong & Guo, 2021. Nano Today 41, 101290



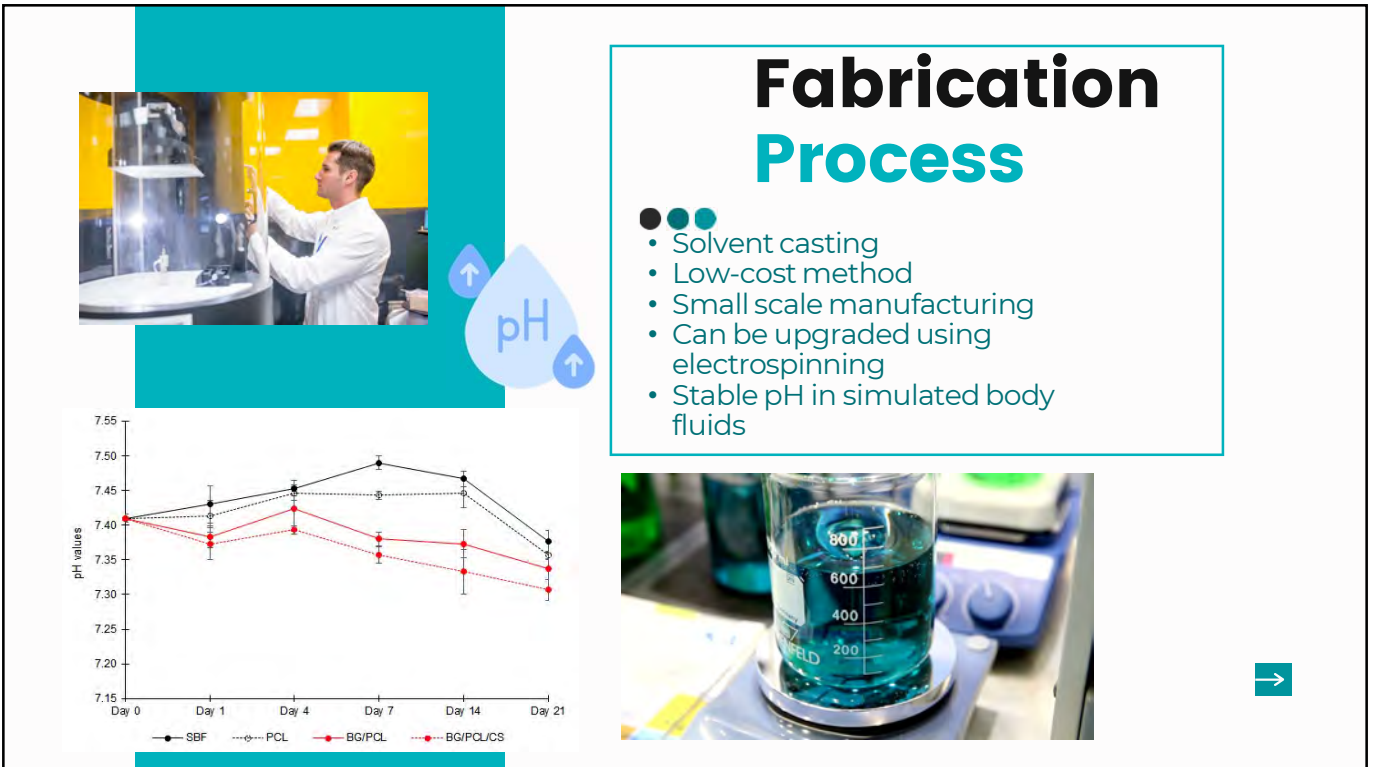
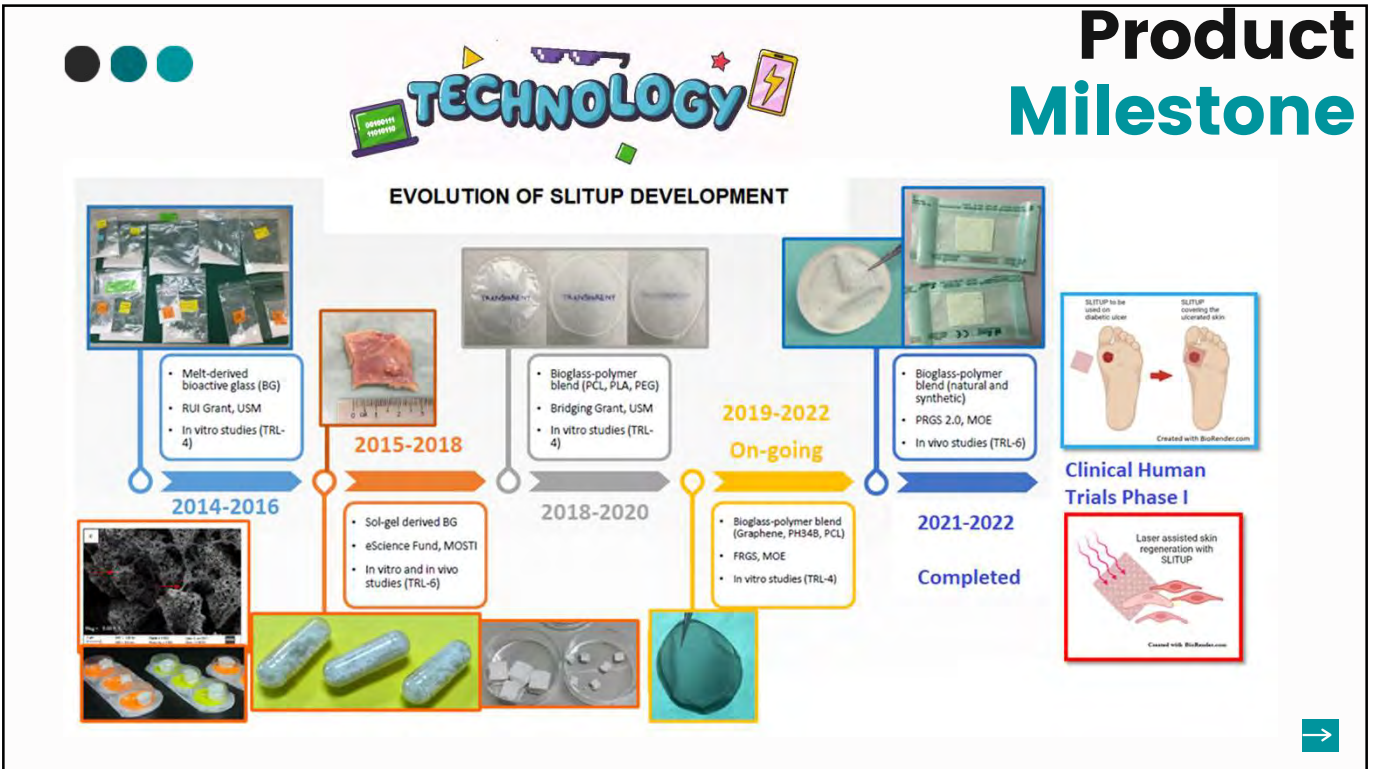
**SLITUP**  
Advanced Wound Dressing

KPT's Niche Areas: **ADVANCED MATERIALS**



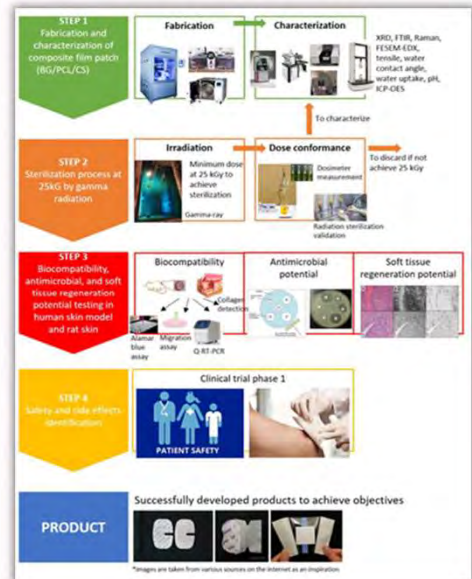
RESOLVE  
the PROBLEM





# Sterilisation Process

- Sterilisation through gamma irradiation at Malaysian Nuclear Agency
- Ionic elements important for soft tissue regeneration



## The Role of Calcium in Wound Healing

Thayazlin Subramanian, Mh Busha Fauzi, Yogeswaran Lokaanathan and Jia Xian Law

Center for Tissue Engineering and Regenerative Medicine, Universiti Kebangsaan Malaysia Medical Centre, Cheras, Kuala Lumpur 50601, Malaysia; subramanianthayazlin@gmail.com (T.S.); lokaanathan@ukm.edu.my (M.B.F.); yogeswaran@ukm.edu.my (Y.L.); lawjiaxian@ukm.edu.my (J.X.L.)

\* Correspondence: lawjiaxian@ukm.edu.my; Tel.: +60-3-9145-2977

**Abstract:** Skin injury is quite common, and the wound healing is a complex process involving many types of cells, the extracellular matrix, and soluble mediators. Cell differentiation, migration, and proliferation are essential in restoring the integrity of the injured tissue. Despite the advances in science and technology, we have yet to find the ideal dressing that can support the healing of cutaneous wounds effectively, particularly for difficult-to-heal chronic wounds such as diabetic foot ulcers, bed sores, and venous ulcers. Hence, there is a need to identify and incorporate new ideas and methods to design a more effective dressing that not only can expedite wound healing but also can reduce scarring. Calcium has been identified to influence the wound healing process. This review explores the functions and roles of calcium in skin regeneration and reconstruction during wound healing. Furthermore, this review also investigates the possibility of incorporating calcium into scaffolds and examines how it modulates cutaneous wound healing. In summary, the preliminary findings are promising. However, some challenges remain to be addressed before calcium can be used for cutaneous wound healing in clinical settings.

**Keywords:** calcium; skin; wound healing; fibroblast; keratinocyte



**Citation:** Subramanian, T.; Fauzi, M.B.; Lokaanathan, Y.; Law, J.X. The Role of Calcium in Wound Healing. *Int. J. Mol. Sci.* **2023**, *24*, 1486. <https://doi.org/10.3390/ijms24021486>

### 1. Introduction

Wound healing is a complex process aimed at restoring the damaged skin to preserve tissue integrity.

### Review

#### Bioactive glass-based fibrous wound dressings

Shahin Homaydani\*, Meng Li\* and Alin R. Buzadalu\*

\*School of Science and Engineering, University of Dundee, Dundee DD1 4HN, United Kingdom and \*Institute of Biomaterials, Department of Materials Science and Engineering, University of Energy Researching, 10008 Energy, Germany

\*Correspondence: Shahin.Homaydani@dundee.ac.uk; Alin.R.Buzadalu@uni-erlangen.de; Email: alin@imr.uni-erlangen.de

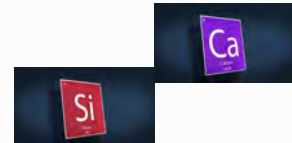
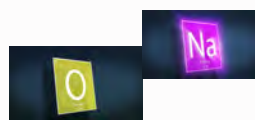
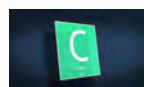
Received: 14 July 2022; Accepted: 1 July 2022

**Abstract:** Since the discovery of vitreous bioactive glass (BG) by Leary in 1968, different classes of BGs have been researched over decades mainly for bone regeneration. More recently, utilising the beneficial influence of BGs with various compositions on angiogenesis, neuroregeneration and bacterial infection, the applicability of BGs has been extended to soft tissue repair and wound healing. Particularly, fibrous wound dressing comprising BG particles reinforced polymer scaffolds and cotton-candy-like BG fibers have been proposed to be beneficial for wound healing applications. Such fibrous dressing systems include the physical structure of BG scaffolds/matrix and release biologically active ions (e.g., hydroxyl, pro-angiogenic, pro-epithelial, and antibacterial ions, i.e., boron, copper, zinc, etc.). BGs can promote cellular activities to regenerate the lost cells and aid to release new vessels formation, while creating an anti-infection environment. In the current review, we discuss different BG fibrous dressing systems for wound healing applications and cover the relevant literature in this topic. The production strategies for BG fibrous dressings are explained and as fibrous wound dressing materials, their wound healing and bactericidal mechanisms, depending on the ions they release, are discussed. The present gaps in this research area are highlighted and new strategies to address them are suggested.

**Keywords:** fibrous; BG; angiogenesis; bioactive glass fibers

**Highlights:**  
 • Novel fibrous bioactive glass (BG) nanoscaffolds are comprehensively reviewed.  
 • BG fibrous wound dressing are made from BG particles reinforced polymer fibers and cotton-candy-like BG fibers.  
 • Their dressing, antibacterial and their opening are typical fabrication techniques for BG fibers.  
 • BG fibrous dressing release biologically active ions for angiogenesis and wound healing.

Element	Control	15 kGy of gamma	25 kGy of gamma	15 kGy of low EB	25 kGy of low EB
C					
O					
Na					
Si					
Ca					



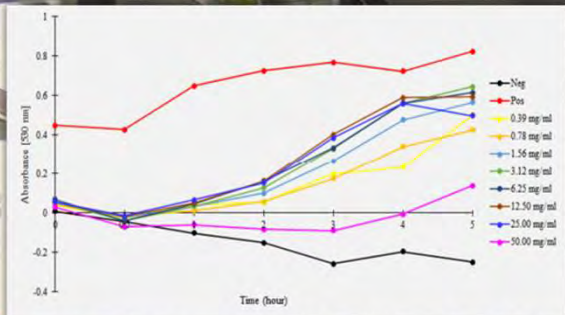


# SLITUP




## Composite Film Patch for soft Tissue Regeneration








Time (hour)	Neg	Pos	0.39 mg/ml	0.78 mg/ml	1.56 mg/ml	3.12 mg/ml	6.25 mg/ml	12.50 mg/ml	25.00 mg/ml	50.00 mg/ml
0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	-0.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	-0.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	-0.25	0.75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	-0.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	-0.25	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

- Antiseptic ready to use
- Medicated
- Non-stick cover at centre of wound
- Stays better on skin in water
- Blends beautifully with skin
- **Not resorbable**

- Elastic fabric plaster
- Strong adhesion
- Non-stick wound pad to protect and cushion the wound
- Breathable and water repellent
- **Not resorbable**

- Steri-strip
- Adhesive skin closure
- Barrier protection
- Less scarring compared to suture or staples
- Wound support
- **Not resorbable**



- **Bioactive**
- **Biocompatible**
- **Bacteriostatic**
- **Non-toxic**
- **Resorbable**
- **Presence of ionic elements important for healing**



- Safe to use
- Slitup contains natural and synthetic products that is FDA approved





- Oral ulcer
- Oral CA
- Skin ulceration
- Diabetic foot ulcer
- Trauma / Cuts
- Guided tissue regeneration of periodontal problems











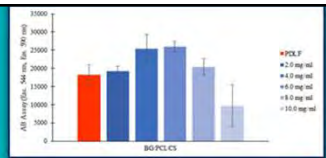
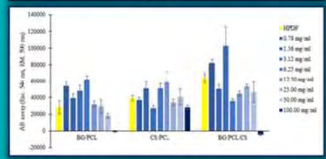
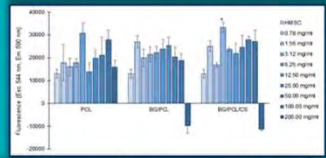
- Clean
- Gamma radiation for sterilisation



## TRL 6: Demonstration in real environment

In vitro and in vivo studies

**Histological appearance at Day 1**

Condition	4x	10x	40x
Skin covered with gauze (Control, R7)			
Skin covered with Slitup without bacteria (Slitup-SA, R6)			
Skin covered with Slitup with bacteria (Slitup+SA, R13)			

**Human primary dermal fibroblasts in scratch migration assay. All magnification at 4x**

Condition	0 hrs	2 hrs	8 hrs	24 hrs
Neg. Control				
Control				
Slitup				

**frontiers**  
in Bioengineering and Biotechnology

**REVIEW**  
published: 02 February 2021

**Selection of Appropriate Wound Dressing for Various Wounds**

Chengyu Sun<sup>1,2\*</sup>, Chengyu Wang<sup>2</sup>, He Liu<sup>1</sup>, Qijun Li<sup>1</sup>, Rongchang Li<sup>1</sup>, Yan Zhang<sup>1</sup>, Xuefei Liu<sup>1</sup>, Ying Zhao<sup>1,3\*</sup> and Jiancheng Wang<sup>1,2\*</sup>

<sup>1</sup>Department of Plastic, Reconstructive and Burn Surgery, The First Hospital of Jilin University, Changchun, China; <sup>2</sup>Department of Plastic and Reconstructive Surgery, The First Hospital of Jilin University, Jiamusi, China; <sup>3</sup>Department of Plastic and Reconstructive Surgery, The First Hospital of Jilin University, Jiamusi, China

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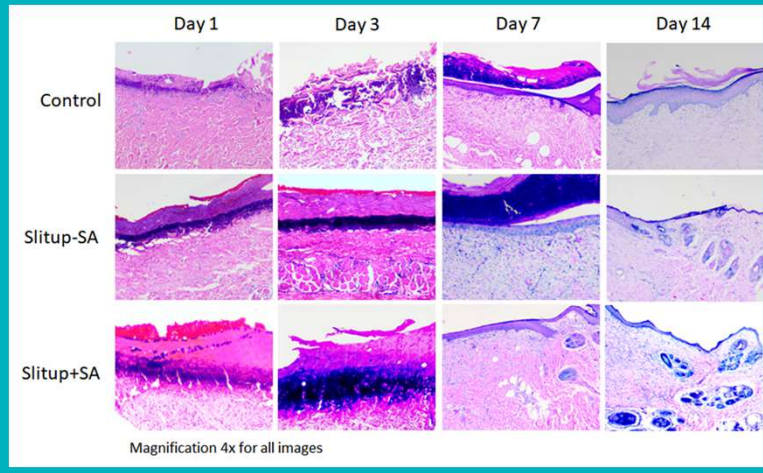
**CITATION:**  
Sun C, Wang C, Liu H, Li Q, Li R, Zhang Y, Liu X, Zhao Y and Wang J (2021) Selection of Appropriate Wound Dressing for Various Wounds. *Front. Bioeng. Biotechnol.* 12:638611. doi: 10.3389/fbioe.2020.638611

**INTRODUCTION**

Physical or thermal damage can cause defects or interruptions to the epidermis of the skin or mucous membranes, forming a wound (Shtalig et al., 2013). Wounds are classified as acute or chronic wounds. Acute wounds can recover in a short period of time. The size, depth, and degree of injury of the wound are factors that influence the healing process. However, the healing process of chronic wounds is longer and different from that of acute wounds (Schmitt et al., 2018). The healing of acute wounds occurs in a normal, orderly and timely manner throughout the entire process. However, the repair of chronic wounds is a challenging, and it is difficult to restore normal anatomical structure and function (Dermoses and Schuller, 2006; Zhen et al., 2018).

There are many factors involved in wound healing (Cline and Dipertino, 2010). The healing process is not static and growth involves the different phases: namely, coagulation and hemostasis, inflammatory, proliferation, and remodeling. These phases are not independent but partially overlap on the basis of a sequence for hemostasis, inflammatory, proliferation, and remodeling (Fitzmaurice and Tinkens, 2016; Wolfson et al., 2017). After skin injury, the wound or tissue fracture is filled with blood clots, followed by acute inflammation of the surrounding tissue. The release of inflammatory mediators and infiltration of inflammatory cells cause tissue swelling and pain. Proliferating fibroblasts, endothelial cells, and newly formed capillaries interact to form granulation tissue filling the crevice. During the shaping period, the scar is formed without affecting the tensile strength through the action of various enzymes and stress, thereby adapting to physiological functions (Hoffman, 2012; Karyer et al., 2015; Trankle et al., 2016; Johnson et al., 2017a,b).

Medical dressings are essential devices in healthcare. According to the type and stages of wounds, dressings can be applied to their surface and promote healing. The therapeutic effects



**Animal Ethics Approval No:  
USM/IACUC/2021/(EXP)/(1137)**

**IPs**

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REFERENCE NO.: 75/02/2022/233

NAME OF PRINCIPAL INVENTOR: - ASSOC. PROF. DR. SITI NOOR FAZLIHA BINTI MOHD NOOR

TITLE: - BG/PCUCS COMPOSITE FILM PATCH

SCHOOL/CENTRE/DEPARTMENT: - ADVANCED MEDICAL AND DENTAL INSTITUTE

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I hereby declare that I have received and perused all the above mentioned documents submitted to Centre for Innovation & Consultation.

PROFESOR IR. DR. SIKALIA A/P SHEEKANTAN  
DIRECTOR  
CENTRE FOR INNOVATION & CONSULTATION  
UNIVERSITI SAINS MALAYSIA  
DATE: 26 AUGUST 2021

**AKTA HAK CIPTA 1987**  
PERATURAN-PERATURAN HAK CIPTA (PEMBERANTAHAN SUKARELA) 2012

**SUL PEMBERANTAHAN HAK CIPTA**  
(Subperaturan RQ2)

No. Pemberantahan: : CRL/2021P01016  
Tajuk Karya : BG/PCUCS FILM  
Jenis Karya : SASTERA  
Tarikh Permohonan : 26 MAC 2021

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ZULKARNAIN MUHAMMAD  
TIMBALAN PENGAWAL HAK CIPTA  
MALAYSIA

(Agensi di bawah Kementerian Perdagangan Dalam Negeri dan Hal Ehwal Perdagangan)

**AKTA HAK CIPTA 1987**  
PERATURAN-PERATURAN HAK CIPTA (PEMBERANTAHAN SUKARELA) 2012

**SUL PEMBERANTAHAN HAK CIPTA**  
(Subperaturan RQ2)

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Tajuk Karya : SLTUP  
Jenis Karya : SASTERA  
Tarikh Permohonan : 31 DISEMBER 2021

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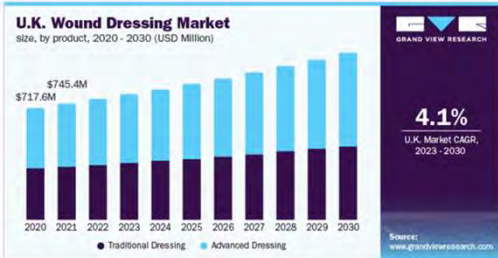
ABDUL HARIS BIN HAJI LAKAR  
PENGAWAL HAK CIPTA  
MALAYSIA

(Agensi di bawah Kementerian Perdagangan Dalam Negeri dan Hal Ehwal Perdagangan)

**Global Advanced Wound Dressings Market Insights:**

The global Advanced Wound Dressings market size is predicted to grow \$8,460.8 million by 2026, exhibiting a CAGR of 4.6% during the forecast period. Advanced Wound Dressings is treatment applied to treat complex wounds to treat and heal wound from harm.

# Commercial Potential



## ADVANCED WOUND DRESSINGS MARKET

Asia Pacific Advanced Wound Dressings Market, 2017



Global Advanced Wound Dressings Market Share, By Product, 2017



Global Advanced Wound Dressings Market (US\$ Mn), 2017 to 2025



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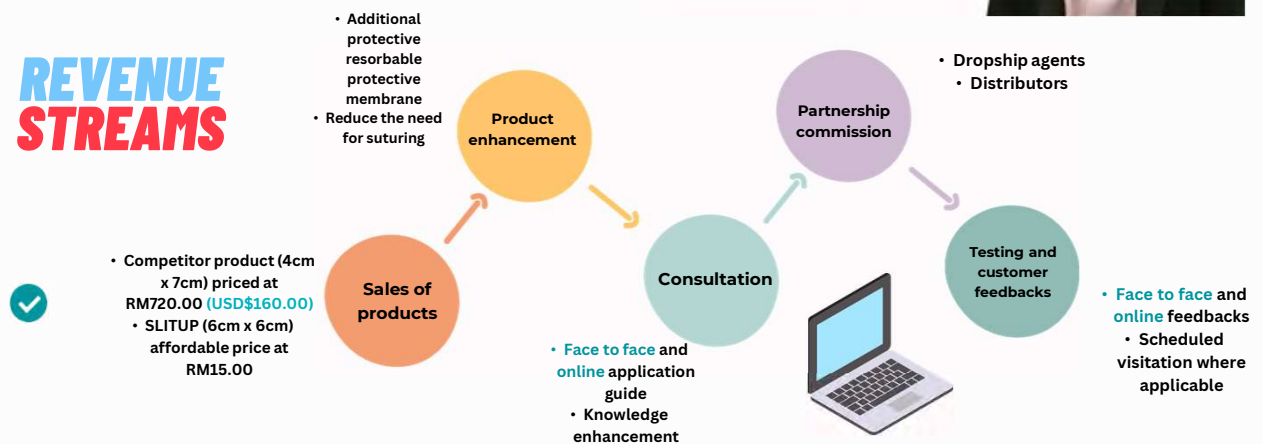
**Malaysian market**


- Veterinary
- Palliative care ward
- Stoma clinic
- Chemists/Pharmacists
- Stores with OTC
- Hospitals & hospital dispensaries
- Supermarkets
- Mass merchandise
- Online retail

## COST STRUCTURE



## REVENUE STREAMS





**RESEARCH COLLABORATION AGREEMENT**

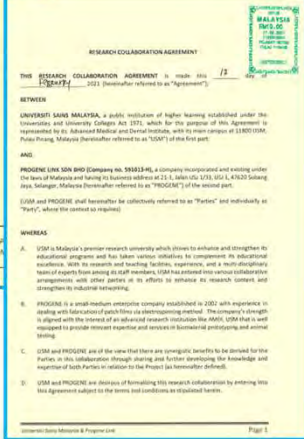
BETWEEN

**UNIVERSITI SAINS MALAYSIA**


AND

**PROGENE LINK SDN BHD**

RESEARCH COLLABORATION ON IN VIVO ASSESSMENT OF BIOACTIVE GLASS-POLYCAPROLACTONE COMPOSITE FILM PATCH FOR TREATMENT OF GINGIVAL ULCERATION



Page 1



Bagian bawah muka surat ini sengaja ditinggalkan kosong





PADA MENYAKSIKAN HAL DI ATAS, Pihak-Pihak kepada Perjanjian ini telah menuntunkan tandatangan dan meterai mereka masing-masing pada hari dan tahun yang mula-mula tertera di atas:

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Di hadapan:

Ditandatangani untuk dan bagi pihak UNIVERSITI SAINS MALAYSIA

Di hadapan:

**Acknowledgment:**

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Prototype  
Research Grant Scheme (PRGS)  
Project No. PRGS/2/2020/SKK07/USM/02/2  
Amount: RM173,600.00

**Human Capital Development:**

Research Assistant: 1  
PhD student: 1

**AIP Conf Proceedings 2020;2267:020059**

**Development of bioactive glass-poly-ε-caprolactone polymer composite film for soft tissue regeneration**

Cite as: AIP Conference Proceedings 2267, 020059 (2020), <https://doi.org/10.1063/1.5101978>  
Published Online: 21 September 2020

S. Siti Fatimah, M. N. Siti Noor Fazilah, O. Molla, et al.

**AIP Conference Proceedings**

**Related Publications**

Scopus ID	Researcher ID
57207730558	GNH-2924-2022
ORCID	Google Scholar ID
0000-0001-9200-265X	m0z6a4QAAAAJ

**Patent Search:**

Patents (5,882) = bioactive AND glass-polycaprolactone-chitosan



**Publications:**

IFMBE Proceedings 2022;86:511-518

**Determination of Suitable Bioactive Glass-Polymer Film Conditioned Medium Extracts for Potential Applications in Tissue Regeneration: A Preliminary Study**

Siti Fatimah Samsurrijal, Siti Noor Fazilah Mohd Noor, Mamun Khan Sujon, and Khirun Musa

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J. Lianan et al. (eds.), 5th Kuala Lumpur International Conference on Biomedical Engineering 2021, IFMBE Proceedings 86, [https://doi.org/10.1007/978-3-030-90724-2\\_55](https://doi.org/10.1007/978-3-030-90724-2_55)

01

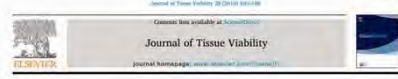


# Impact of product

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**The prevalence and associated factors of skin tears in Belgian nursing homes: A cross-sectional observational study**

Hanne Van Tiggelen<sup>1</sup>, Nele Van Damme<sup>2</sup>, Sofie Thyss<sup>3</sup>, Elise Vanbaste<sup>4</sup>, Sofie Verhaeghe<sup>5</sup>, Kimberly Leffanc<sup>6</sup>, Karen Campbell<sup>7</sup>, Kevin Woo<sup>8</sup>, Ann Van Hecke<sup>9,10</sup>, Elsmit Beckx<sup>11</sup>

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## Advanced Wound Care Management Market: Rising Prevalence of Chronic Wounds to Drive the Market

Published: Aug 12, 2022

Wilmington, Delaware, United States, Transparency Market Research Inc. - According to a research report by the Transparency Market Research, the global advanced wound care management market was evaluated at US\$ 8.531 billion in the year of 2017 and the industry is set to grow at a steady CAGR of 5.8 % during the forecast period of 2018 to 2026.

The research authors at Transparency Market Research project that the global advanced wound care management market will expand to reach the evaluation of US\$ 14.05 billion by the end of the forecast period i.e. 2026. Key reasons behind this upward trajectory are increasing prevalence of chronic wounds, rising patient awareness, increasing need for treating complex wounds, technological advancements in healthcare and medical industries, and increase in the healthcare expenditure.

**ARTICLE INFO**

**ABSTRACT**

**Background:** Although skin tears are among the most prevalent acute wounds in nursing homes, their recognition is a complex challenge because of their diversity. Effective prevention or at least of minimizing skin tears due to preventable skin fragility and other modifiable risk factors. In order to prevent preventable skin tears, patients at risk should be identified in a timely manner.

**Objective:** To determine the point prevalence of skin tears and (2) to identify various independent risk factors associated with skin tear presence in nursing home residents.

**Methods:** A cross-sectional observational study was set up, including 1103 residents at 12 Belgian nursing homes. A convenience sample of residents was selected to represent independent associated factors (age, gender, skin type, and comorbidities).

**Results:** The final sample consisted of 702 nursing home residents, of which 24 percent with skin tears, on average. The point prevalence of skin tears was 3.4 percent. A total of 118 different skin tears were identified according to the International Skin Tear Advisory Panel (ISTAP) Classification System and 75.0% were located on the lower extremities. The independent associated factors were identified as: history of skin tears, chronic use of corticosteroids, dependence for residents, and use of adhesive devices.

**Conclusion:** The study revealed a high prevalence of skin tears among nursing home residents. Age, history of skin tears, chronic use of corticosteroids, dependence for residents, and use of adhesive devices were the independent associated with skin tear presence.

**1. Introduction**

Maintaining and improving skin health is increasingly recognized as one of the safest quality indicators across the entire continuum of health care settings. Evidence-informed practices to promote skin integrity and prevent breakdowns are strongly recommended to safeguard patient safety, minimize costs, benchmark performance, and advance care that is more cost-effective compared to wound treatment [1-10].

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P307

### Telemedicine consultation for patients with chronic wounds especially pressure ulcers

N. Salles, J. Jenn, M. Barateau, O. Sarry, K. Libert, M. Baudinet, M. Rainfray

Pôle de gériatologie clinique, hôpital Xavier-Arnoz, CHU de Bordeaux, Bordeaux, France

<http://dx.doi.org/10.1016/j.eurger.2013.07.371>

02



Encyclopedia of Materials: Plastics and Polymers

Volume 9, 2022, Pages 717-733

### Current Trends in the Development of Wound Dressings, Biomaterials and Devices

Alicia Bazarac, javanta.Bhattacharya

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<https://doi.org/10.1016/B978-0-12-820513-1.00117-4>

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## Impact of product

**Abstract**

Wound repair and regeneration of structurally and functionally active tissues is extremely challenging and comprise of one of the major developing sectors in the healthcare industry. Under normal circumstances wound healing proceeds through the four overlapping phases of hemostasis, inflammation, proliferation, and remodeling; however, for chronic cases, the healing stalls owing to the presence of repeated external stimuli and existing micro-environmental anarchy at the wound site. Persistent problems in the healing of chronic wounds lead to ulceration and, under severe circumstances



03



COMPREHENSIVE INVITED REVIEW

### Wound Dressings and Comparative Effectiveness Data

Aditya Sood<sup>1</sup>, Mark S. Grwick<sup>2</sup>, and Nancy L. Temam<sup>3</sup>

<sup>1</sup>Department of Public Health and Primary Care, Ghent University, Ghent, Belgium  
<sup>2</sup>Department of Public Health and Primary Care, Ghent University, Ghent, Belgium  
<sup>3</sup>Department of Public Health and Primary Care, Ghent University, Ghent, Belgium

**Significance:** Injury to the skin provides a unique challenge, as wound healing is a complex and intricate process. Acute wounds have the potential to resolve over the acute wound to chronic wounds, requiring the physician to have a thorough understanding of various interventions to bring these wounds back into the healing cycle.

**Recent Advances:** The development of new and effective interventions in wound care presents an area of intense research. Negative pressure wound therapy (NPWT) has emerged as a promising wound care option, with a variety of wound dressings and other emerging therapies that are being evaluated. Other evaluation such as hydrocolloid, adhesive, hydrogel, hydrogel, hydrogel, and hydrogel, and regenerative materials have also proven efficacious in advancing the wound-healing process through a variety of mechanisms.

**Critical Issues:** There is an overwhelming amount of wound dressings available in the market. This makes the lack of full understanding of wound care and management. The point of using advanced dressings is to improve patient quality of life and to reduce the risk of infection and other complications. It is only after properly assessing the wound characteristics and obtaining knowledge about available products that the "best" dressing can be chosen.

**Future Directions:** The future of wound healing at the point of care is exciting. Four high-quality, randomized controlled trials evaluating wound dressings exist and do not clearly demonstrate superiority of newer materials or techniques. Comparative effectiveness research can be used as a tool to evaluate optimal therapy for wound care moving into the future. Used further data emerge, information on the available products and optimal clinical thought must prevail.

**SCOPE AND SIGNIFICANCE**

This issue is the latest volume of the journal, with a significant number of articles. The journal is published quarterly and covers a wide range of topics in the field of wound care. The journal is a must-read for anyone involved in the field of wound care, whether they are a clinician, researcher, or student.

**Injury to the skin provides a unique challenge, as wound healing is a complex and intricate process. With more than 4.5 million people in the United States annually, and 8.5 million people in the United Kingdom, it is no wonder why chronic wounds have become a global health issue. While the use of traditional dressings has been a topic of ongoing research and debate worldwide, the development of new and effective interventions is a complex and intricate process.**

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04



## Impact of product

### New Economic Model

- IMPROVED RAKYAT QUALITY OF LIFE
- ENTREPRENEURIAL AND INNOVATIVE
- SUSTAINABILITY
- HIGH INCOME
- JOB CREATION



05



## Impact of product



**Articles**

### The environmental footprint of health care: a global assessment

**Summary**  
Background: Health-care services are necessary for sustaining and improving human wellbeing, yet they have an environmental footprint that contributes to environment-related threats to human health. Previous studies have quantified the carbon emissions resulting from health care at a global level. We aimed to provide a global assessment of the wide-ranging environmental impacts of this sector.

**Methods:** In this multiregional input-output analysis, we evaluated the contribution of health-care sectors in driving environmental damage that in turn puts human health at risk. Using a global supply-chain database containing detailed information on health-care sectors, we quantified the direct and indirect supply-chain environmental damage driven by the demand for health care. We focused on seven environmental stressors with known adverse Swellack cycles: greenhouse gas emissions, particulate matter, air pollutants (nitrogen oxides and sulphur dioxide), nuclear risk, reactive nitrogen in water, and water water use.

**Findings:** Health care causes global environmental impacts that, depending on which indicator is considered, range between 1% and 5% of total global impacts, and are more than 5% for some national impacts.

**Interpretation:** Enhancing health-care expenditure to mitigate negative health effects of environmental damage is



