



# Apiceuticals

Exploring  
A New Generation  
Of Medicines

# Apiceuticals

## Exploring A New Generation Of Medicines

*Whoever looks at a beehive should actually say with an exalted mind; making this detour by way of the beehive the entire cosmos can find its way into human beings and help to make them sound in mind and body*



Rudolf Steiner  
Nine Lectures on Bees 1923

# Apiceuticals

## Exploring A New Generation Of Medicines

### Medicine Redefined

- c. 1200, "medical treatment, cure, remedy,"
- Used figuratively, **of spiritual remedies** perhaps originally *ars medicina* "**the medical art,**"
- From Old French *medecine* (Modern French *médecine*)  
"medicine, **art of healing**, cure, treatment, potion,"
- From Latin *medicina* "**the healing art**, medicine; a remedy,"

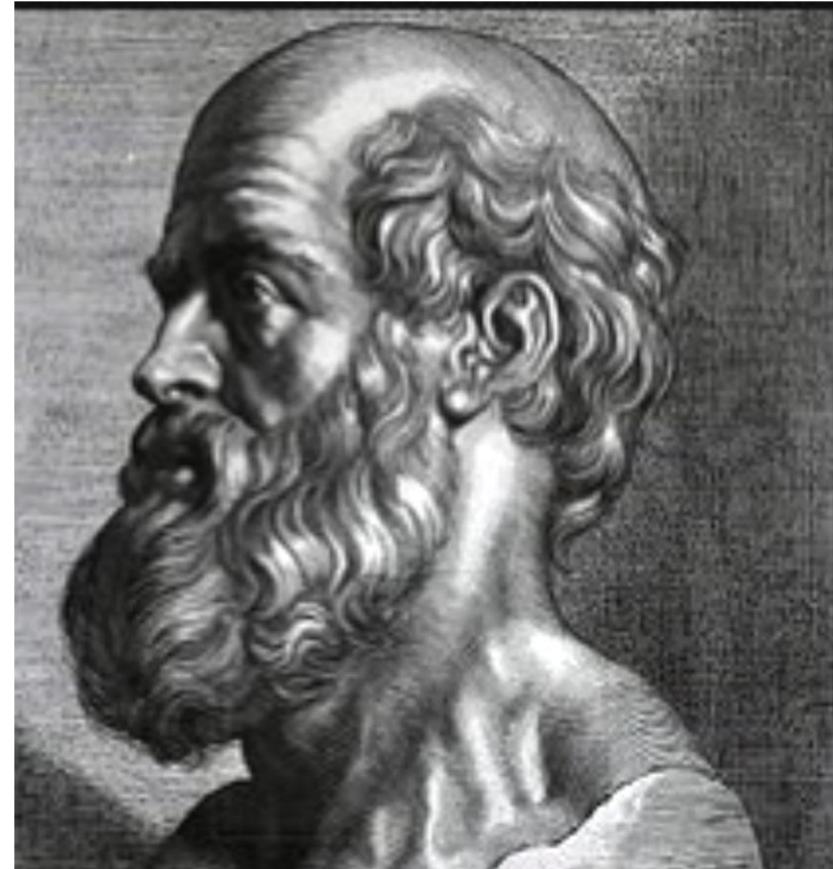
# Apiceuticals

## Exploring A New Generation Of Medicines

### Medicine as Art - Three Dimensional

The art of medicine consists  
of three elements: the  
disease, the patient and  
the doctor

Hippocrates 460 - 370 BC





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### 20<sup>th</sup> Century

### Down to One Dimension

A medicinal product is: ...

any substance or combination of substances that may be used by or administered to human beings with a view to restoring, correcting or modifying a physiological function by exerting a pharmacological, immunological or metabolic action, or making a medical diagnosis.



Medicines &  
Healthcare products  
Regulatory Agency





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### Modern Pharmaceutical Medicine

- Physical
- Scientific – Cause and Effect
- Single Molecule
- Synthetic
- Targeted -Symptom related
- Risk Benefit
- Clinically Trialled – Proven - Licensed





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### PROBLEM 1 - resistance

“If vancomycin – resistant genes become established in S Aureus they will move into other strains of MRSA, which are basically resistant to everything we have”

Brian Spratt –  
Professor of Molecular Biology, Imperial College



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# PROBLEM 2 - side effects

Some 100,000 people in the US die from prescription drug side effects every year and 7% of all hospital admissions in the country are due to adverse drug reactions, costing the healthcare system nearly \$150bn.

### Aspirin Side Effects

A  
S  
P  
I  
R  
I  
N

Asthma  
Salicyalism  
Peptic ulcer disease/  
Phosphorylation-oxidation  
uncoupling/ PPH/  
Platelet disaggregation/  
Premature closure of PDA  
Intestinal blood loss  
Reye's syndrome  
Idiosyncrasy  
Noise (tinnitus)





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# PROBLEM 3 - iatrogenesis

Globally, as of 2013, an estimated 20 million negative effects from treatment occurred.

It is estimated that 142,000 people died in 2013 from adverse effects of medical treatment, up from 94,000 in 1990.

### IATROGENIC DISEASE

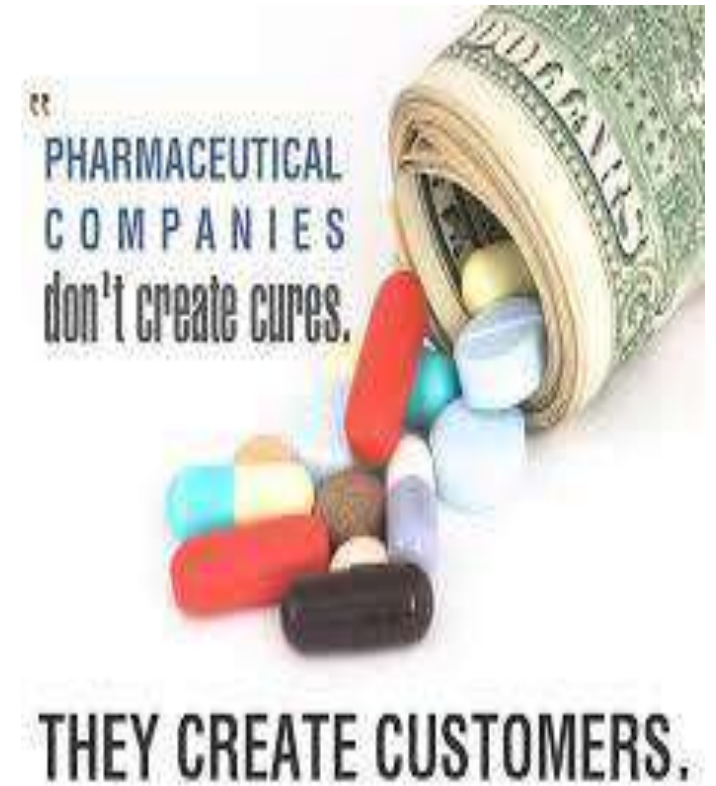
- Physician induced disease
- An adverse consequence of a preventive, diagnostic or therapeutic regimen or procedure that causes impairment, handicap, disability or death resulting from a physician's professional activity.
- Can prolong hospital stay
- Requires special treatment
- Threaten life.

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### PROBLEM 4 - profit

It is estimated that in 2015 that big Pharma spent over 230 million dollars on lobbying efforts. One of the major things that pharmaceutical companies lobby against is marijuana legalization because it is showing that it can be a healthy natural alternative to many of their deadly and harmful drugs.





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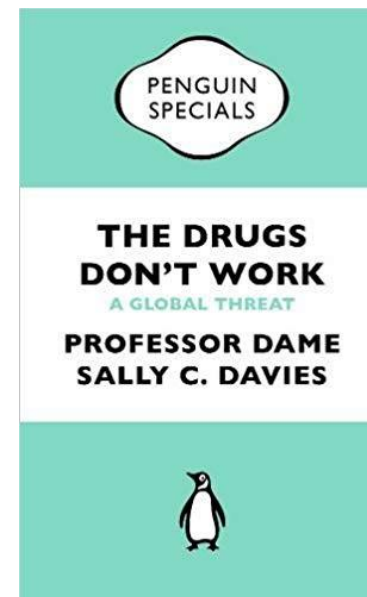
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# PROBLEM 5 - inefficiency

The vast majority of drugs – more than 90% - only work in 30 -50% of the people



Dr Allen Roses –Vice President of GSK

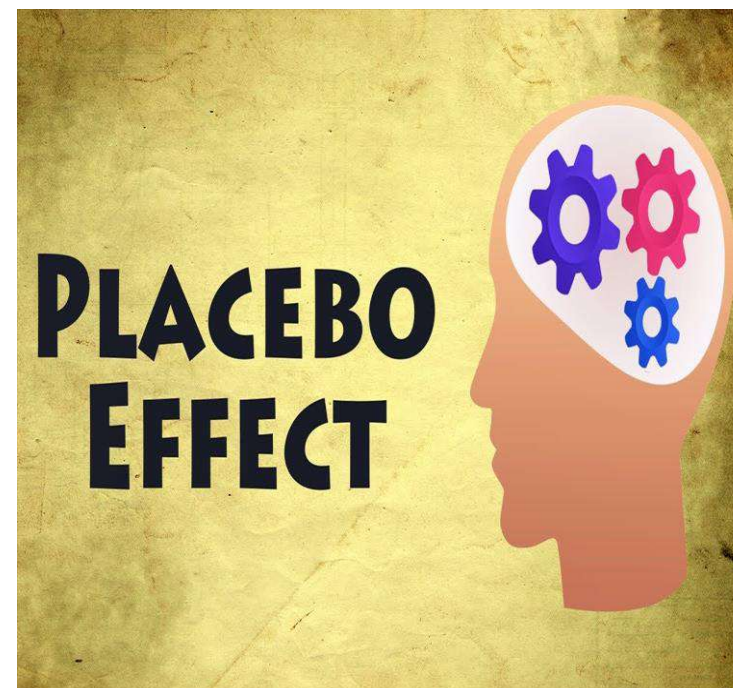


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# PROBLEM 6 - placebo

A placebo is an inert substance or treatment which is designed to have no therapeutic value. Common placebos include inert tablets, inert injections, sham surgery, and other procedure





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# PROBLEM 7 – remission

The problem of Chronic Health and the presence of Spontaneous Healing and Radical Remission





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### Kelly Turner - Radical Remission Three Dimensions?

PHYSICAL	1	Radically changing your diet
PHYSICAL	2	Herbs and supplements
PHYSICAL	3	Taking control of your health
SOCIAL	1	Releasing suppressed emotions
SOCIAL	2	Increasing positive emotions
SOCIAL	3	Embracing social support
SPIRITUAL	1	Following your intuition
SPRITUAL	2	Deepening your spiritual connection
SPIRITUAL	3	Having strong reasons for living



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## Exploring A New Generation Of Medicines

Back to a threefold Model of medicine

**The art of medicine consists  
of three elements: the  
disease, the patient and  
the doctor**

**The Disease  
The Patient  
The Doctor**

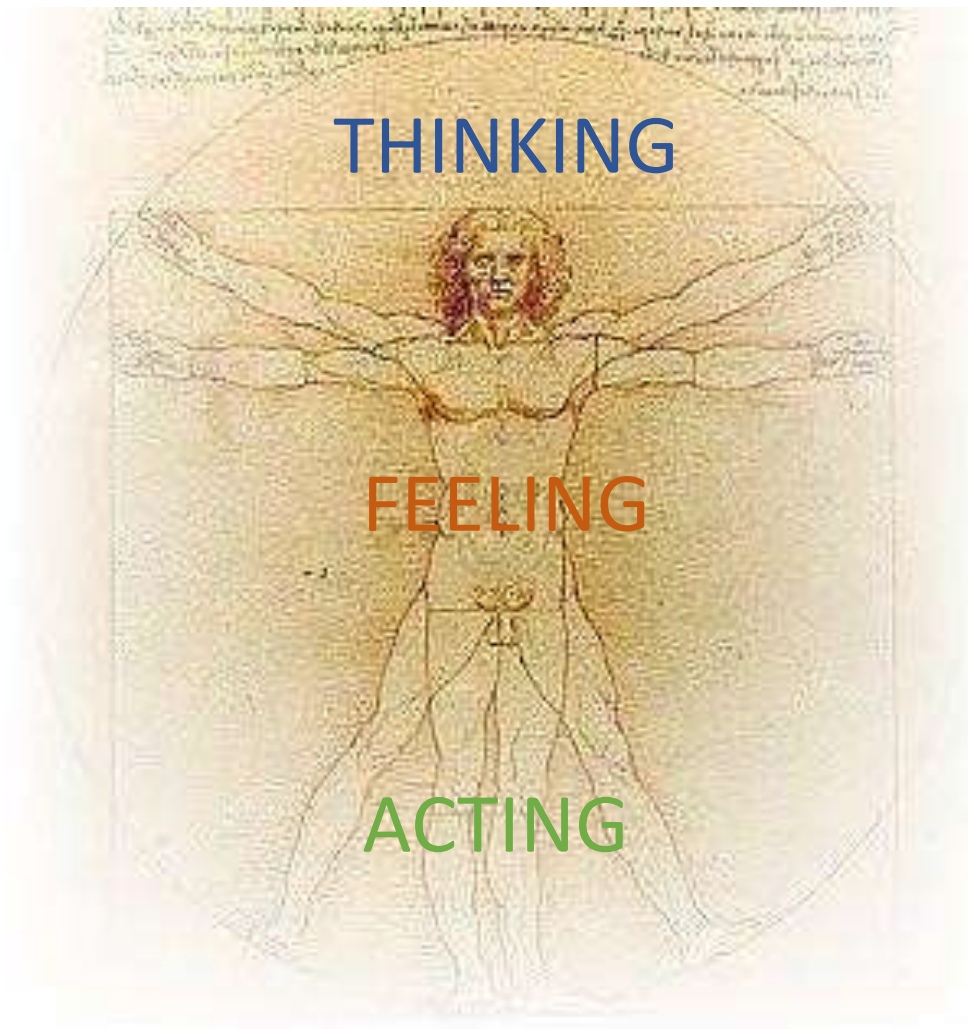
**The Physical  
The Social  
The Spiritual/Cultural/Educator**

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## Exploring A New Generation Of Medicines

# BUT

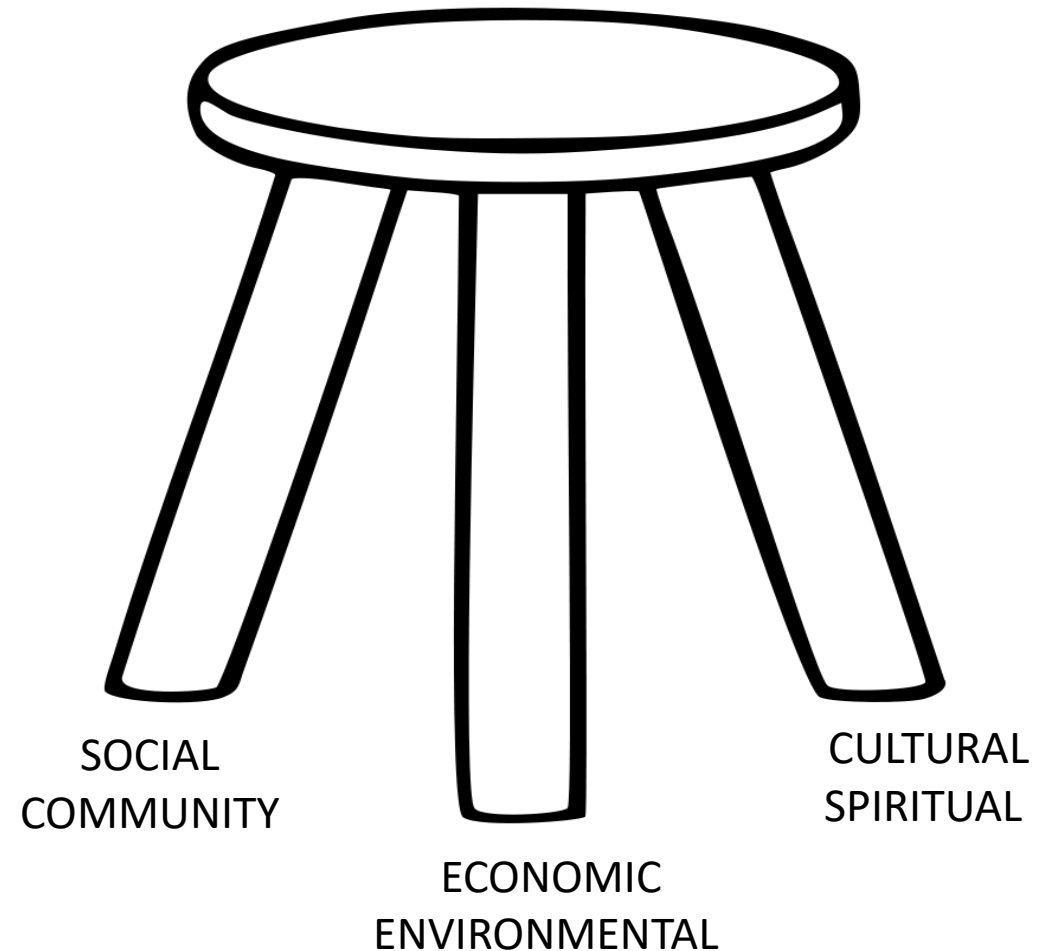
The Human Being  
is Three  
Dimensional



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The Social Order  
is Three Dimensional

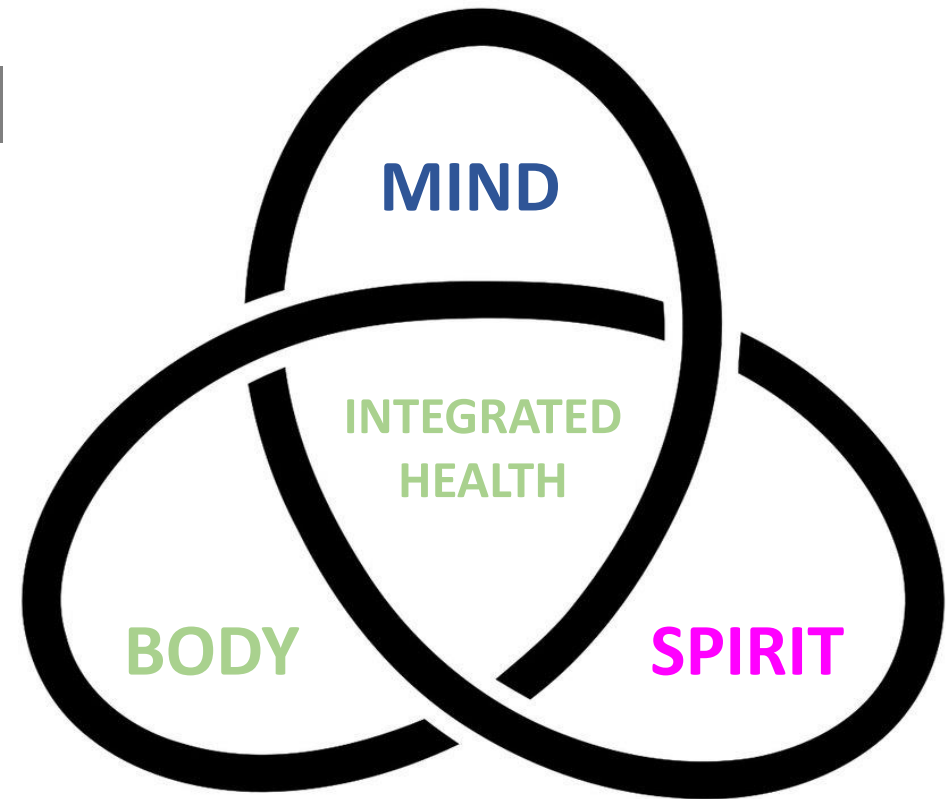


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## Exploring A New Generation Of Medicines

Medicine is  
Three Dimensional

Separate  
but connected



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## Exploring A New Generation Of Medicines

### Back to Three Dimensional Medicine

**PHYSICAL  
BEING**  
Primarily  
Physical  
Medicine

**SOCIAL  
BEING**  
Primarily  
Social  
Medicine

**SPIRITUAL  
BEING**  
Primarily  
Spiritual  
Medicine

**MAN  
THE  
MACHINE**

Orthodox  
Allopathic

Manipulation  
Naturopathy  
Herbalism

Ayurveda  
Homeopathy  
Acupuncture  
Reiki  
Bio energetics  
Apitherapy

TCM  
Anthroposophic  
Psychological  
Art Therapy

Mind Body  
Logotherapy  
Meditation  
Biographical  
Counselling

**MAN  
THE UNIQUE  
'I'**

Spiritual  
Psychology  
Spiritual  
Healing



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### Rediscovering Propolis - 30 years ago





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### Defending the City

The honey bee creates the labyrinthine entrance to the hive in a form which they can protect and at the same time ensuring that all the bees must pass through this sterilising environment.



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Used as Medicine Since Ancient times

- Hebrews
- Greeks
- Romans
- Arabs
- Europeans





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### Continuing Use in Eastern European Countries

The combining of propolis with antibiotics increased the effectiveness of the antibiotics by between 10 and 100 times



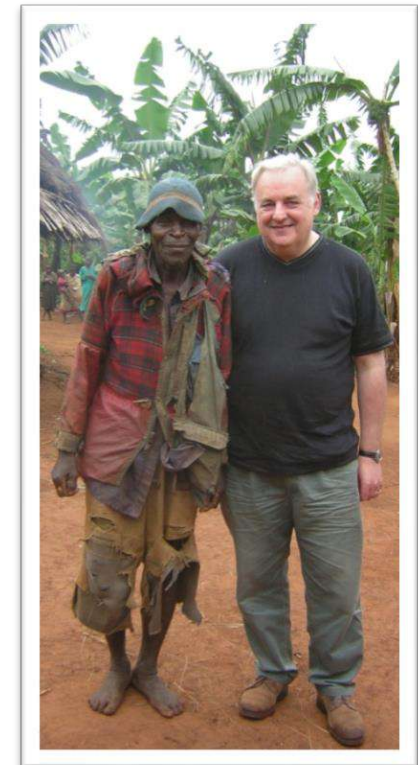
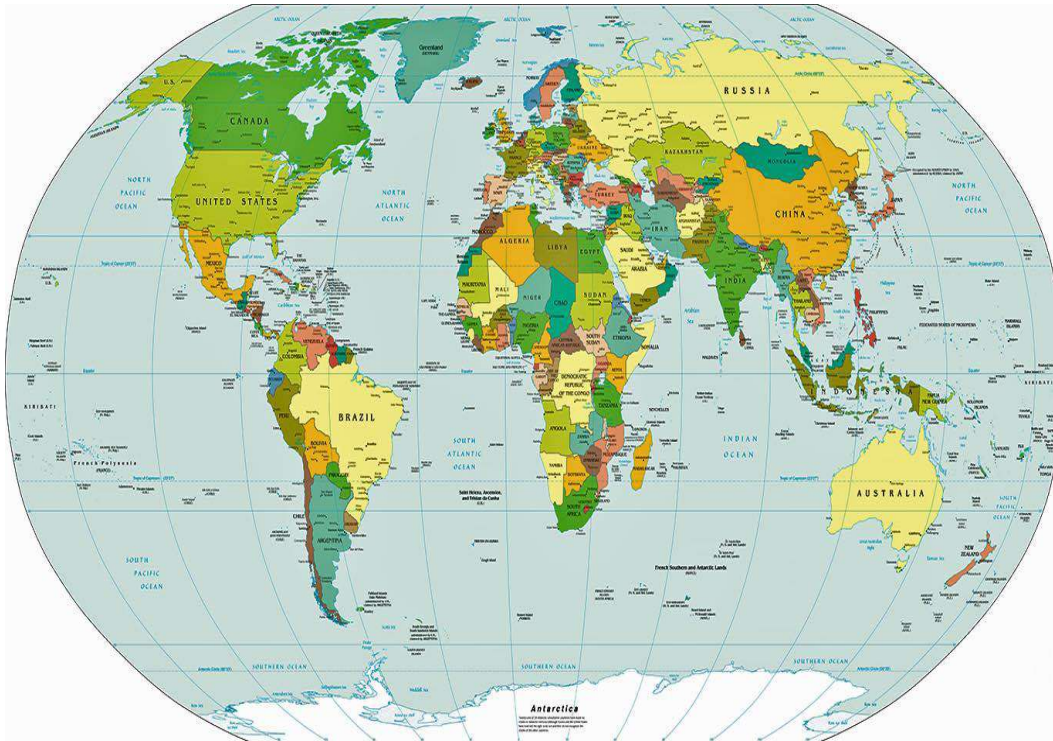
Kazan Veterinary College 1975



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### Collecting propolis samples from round the world





# Apiceuticals

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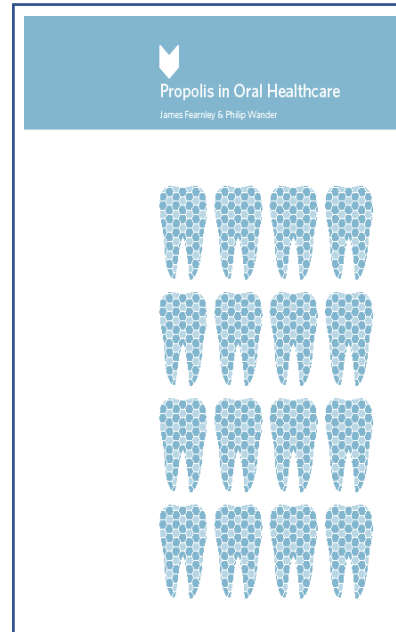
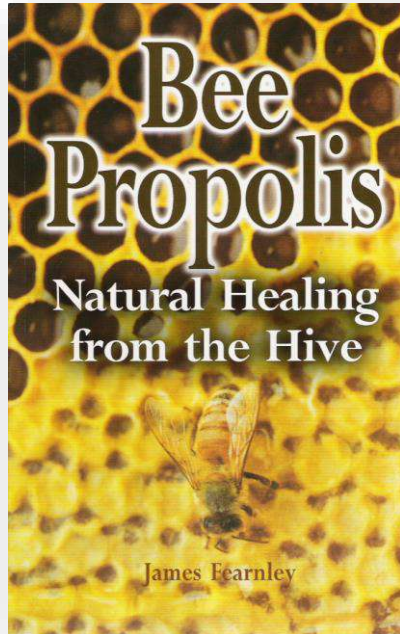
Published research with UK Universities



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### Publications about Propolis





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### Propolis in Scientific Publications ... 1980 -1995

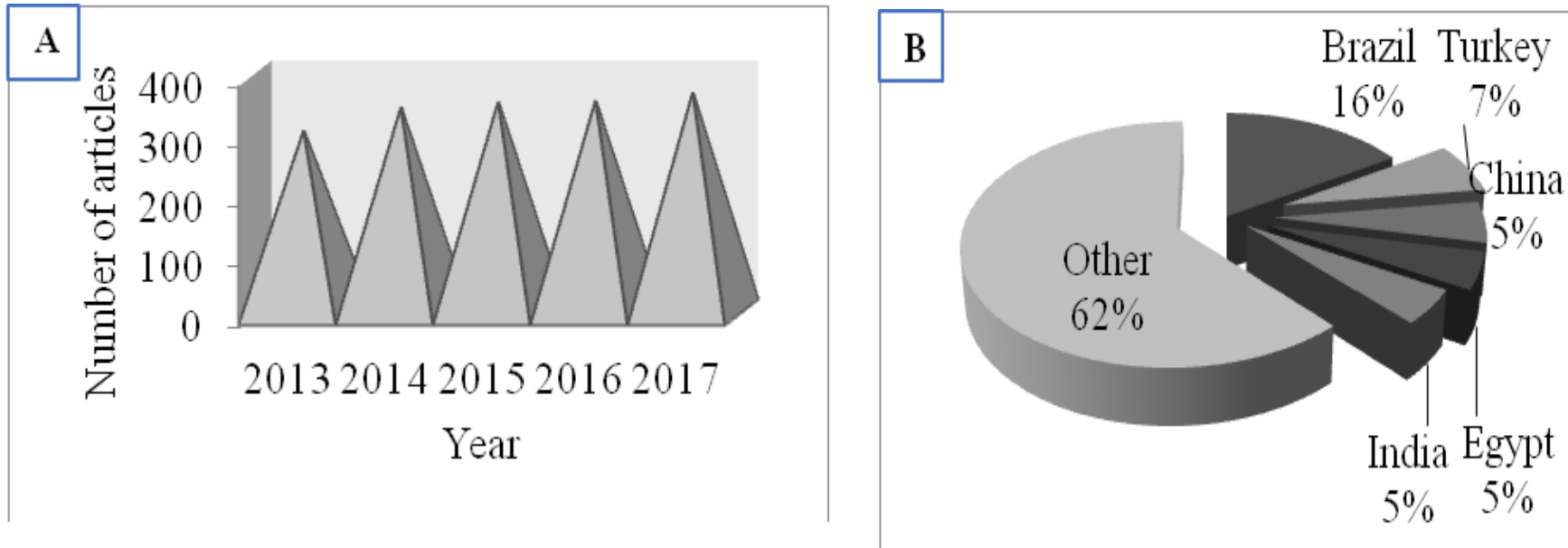
USA	32
Bulgaria	26
Germany	29
Poland	24
Yugoslavia	22
Italy	22
USSR	21
Romania	20
Ukraine	17
France	14
Czechoslovakia	14

United Kingdom	13
Spain	13
Japan	11
Cuba	8
India	8
Brazil	4
Argentina	4
New Zealand	3
Netherlands	3
Egypt	3
Israel	3

Weightman and Garcia University of  
Newcastle upon Tyne 1997

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**Figure 2.** Scientific publication output on Scopus for propolis during 2013 - 2017. (A) Publications by year; (B) Publication by top five countries with their percentage share amongst 94 countries with a total 2095 articles

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### How Does Propolis Work for the Honey Bee

1. The Honey Bee is a Super Organism
2. The Honey Bee Hive as a superorganism has no natural internal immune defence mechanism
3. Honey bees create their immune defence system by collecting the plants defence mechanism i.e. those sticky exudates from a variety of local trees and plants



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## Exploring A New Generation Of Medicines

### How Does Propolis Work for the Honey Bee

1. Honey Bees 'process' these exudates/resins in the hive via their enzymatic system
2. Honey bees transform key chemical constituents taken from the plant, creating unique combinations not found in the plant e.g.

Plants contain  
Bees create

Caffeic Acid and Phenether  
Caffeic Acid Phenyl ester – CAPE



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A Bridge from the plant to the human being?

Result



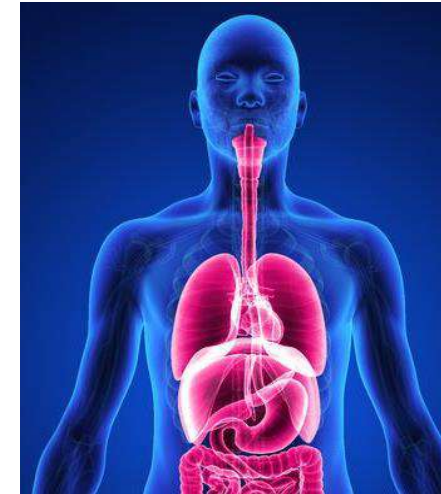
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35 DEGREES

BODY  
TEMPERATURE



37 DEGREES



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How Does it Work for Man

### **1. Stimulating the Immune System**

it is thought that the flavonoids in propolis block the release of histamine which works to stimulate the immune system

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## Exploring A New Generation Of Medicines

How Does it Work for Man

## **2. Inhibiting Inflammation**

Blocking the enzyme inflammation

Propolis is thought to block the development of prostaglandins

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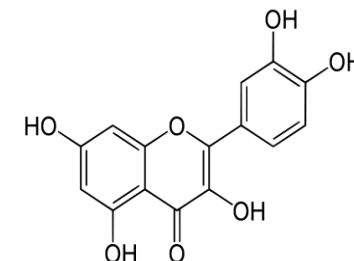
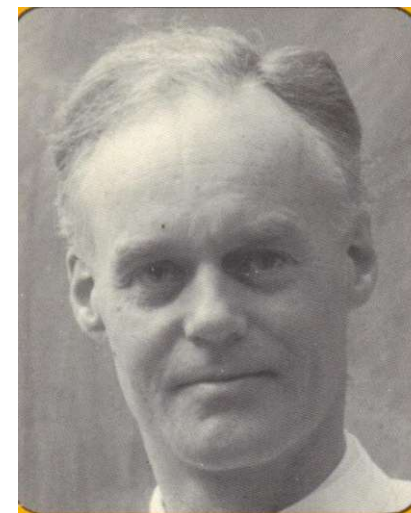
## Exploring A New Generation Of Medicines

How Does it Work for Man

### 3. Works by Sealing up the virus

The protein coating around the virus is maintained by the bioflavonoids in propolis. It is the same as being immune to the virus but only with the presence of bioflavonoids in the propolis.”

**Dr. Bent Havsteen – University of Kiel - Germany**



# Apiceuticals

## Exploring A New Generation Of Medicines

How Does it Work for Man

### 4. Uncoupling the bacteria

Microbiol. Res. (1997) 152, 239–246

Microbiological  
Research

© Gustav Fischer Verlag

Antimicrobial action of propolis and some of its components: the effects on growth, membrane potential and motility of bacteria

O. K. Mirzoeva, R. N. Grishanin, P. C. Calder

Department of Biochemistry, University of Oxford, South Parks Road, Oxford OX1 3QU, United Kingdom

Accepted: April 6, 1997

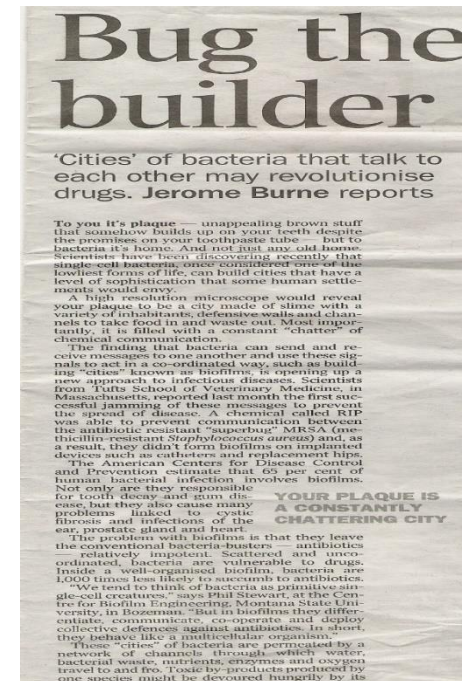
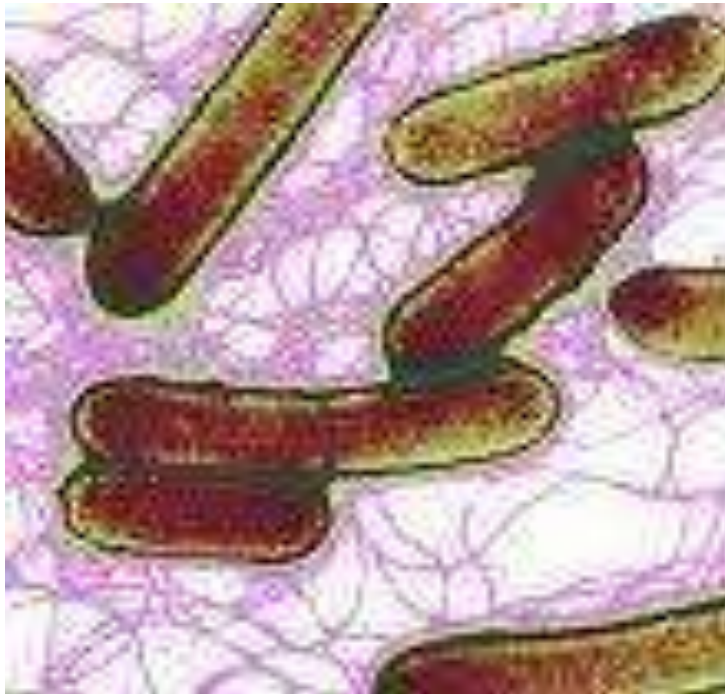


# Apiceuticals

## Exploring A New Generation Of Medicines

How Does it Work for Man

### 5. Switching off the Quorum Sensors





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## Exploring A New Generation Of Medicines

### Creating ARC Apiceutical Research Centre

The Apiceutical Research Centre will research, inform, educate and promote the twin concepts of:

#### 1. Natural Beekeeping

Sustainable beekeeping which restores the natural balance and integrity of the Honey Bee (*Apis mellifera*) enabling it to recover from decades of overexploitation.

The centre will develop a better understanding of sustainable beekeeping through

- Exhibitions
- Research facility (laboratory)
- Information, education and training resource
- Experimental equipment manufacturing facility
- Conferences, courses and events

#### 2. Apiceuticals

Sustainable, evidenced based medicines from the beehive including: honey, propolis, bee venom, royal jelly, wax and bee bread.

The Centre will provide an administrative home for the The International Apiceutical Research Institute and will include:

- Research Laboratory
- Apitherapy Clinic
- Exhibition of Apiceutical Medicine
- Information, education and training resource
- Apiceutical collection equipment manufacturing
- Conferences, courses and events

By way of the beehive the whole Cosmos enters man and makes him strong and able

— Rudolf Steiner Nine Lectures on Bees



# Apiceuticals

## Exploring A New Generation Of Medicines

### Apiceuticals - Propolis

#### ACADEMIC ARTICLES ABOUT PROPOLIS

##### SOURCE : SCOPUS

Number of results : 3724

ACCESS TYPE	YEAR	AUTHOR NAME	SUBJECT AREA	COUNTRY
Open Access	1003	<b>2019</b> <b>11</b> Sforcin, J.M.	46 Agricultural and Biological Sciences	1053 <b>Brazil</b> <b>690</b>
Other	2721	<b>2018</b> <b>389</b> Bankova, V.	43 Arts and Humanities	2 <b>China</b> <b>285</b>
		<b>2017</b> <b>461</b> Rosalen, P.L.	29 Biochemistry, Genetics and Molecular Biology	890 <b>United States</b> <b>263</b>
		<b>2016</b> <b>426</b> Silici, S.	29 Business, Management and Accounting	8 <b>Turkey</b> <b>245</b>
		<b>2015</b> <b>390</b> Popova, M.	28 Chemical Engineering	168 <b>India</b> <b>221</b>
		<b>2014</b> <b>387</b> Bastos, J.K.	25 Chemistry	563 <b>Japan</b> <b>207</b>
		<b>2013</b> <b>362</b> Bruschi, M.L.	24 Computer Science	32 <b>Egypt</b> <b>174</b>
		<b>2012</b> <b>327</b> Kumazawa, S.	24 Decision Sciences	1 <b>Italy</b> <b>164</b>
		<b>2011</b> <b>307</b> Zeoula, L.M.	24 Dentistry	163 <b>Iran</b> <b>150</b>
		<b>2010</b> <b>222</b> Wang, K.	20 Earth and Planetary Sciences	11 <b>Poland</b> <b>126</b>
		<b>2009</b> <b>219</b> Ikegaki, M.	19 Economics, Econometrics and Finance	1 <b>South Korea</b> <b>122</b>
		<b>2008</b> <b>223</b> Trusheva, B.	19 Energy	3 <b>Germany</b> <b>112</b>
		Alencar, S.M.	18 Engineering	127 <b>Spain</b> <b>94</b>
		Hu, F.	17 Environmental Science	158 <b>Indonesia</b> <b>78</b>
		Sawaya, A.C.H.F.	17 Health Professions	31 <b>Saudi Arabia</b> <b>75</b>
		Berretta, A.A.	16 Immunology and Microbiology	249 <b>United Kingdom</b> <b>74</b>
		Hu, F.L.	16 Materials Science	108 <b>Portugal</b> <b>68</b>
		Szliszka, E.	16 Mathematics	15 <b>Taiwan</b> <b>68</b>
		Marcucci, M.C.	15 Medicine	1249 <b>Thailand</b> <b>66</b>
		Stojko, J.	15 Multidisciplinary	45 <b>France</b> <b>65</b>
		Park, Y.K.	14 Neuroscience	48 <b>Argentina</b> <b>64</b>
		Rastrelli, L.	14 Nursing	94 <b>Malaysia</b> <b>64</b>
		Salatino, A.	14 Pharmacology, Toxicology and Pharmaceutics	981 <b>Bulgaria</b> <b>60</b>
		Salazar, L.A.	14 Physics and Astronomy	87 <b>Australia</b> <b>52</b>
		Ahn, M.R.	13 Psychology	1 <b>Mexico</b> <b>50</b>
		Awale, S.	13 Social Sciences	16 <b>Romania</b> <b>49</b>
		Bueno-Silva, B.	13 Veterinary	136 <b>Croatia</b> <b>44</b>
		Chantawannakul, P.	13	<b>Cuba</b> <b>43</b>
		Cuesta-Rubio, O.	13	<b>Algeria</b> <b>37</b>

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### Apiceuticals - Honey

#### ACADEMIC ARTICLES ABOUT HONEY

SOURCE : SCOPUS

Number of results : 16852

ACCESS TYPE	YEAR	AUTHOR NAME	SUBJECT AREA	COUNTRY					
Open Ac	3535	2019	50	Mangum, W.A.	106	Agricultural and Biological Sciences	8255	United States	3282
Other	13317	2018	1875	Evans, J.D.	79	Arts and Humanities	282	China	1389
		2017	1968	Neumann, P.	73	Biochemistry, Genetics and Molecular Bi	2920	India	1168
		2016	1764	Oldroyd, B.P.	73	Business, Management and Accounting	119	United Kingd	875
		2015	1692	Sulaiman, S.A.	66	Chemical Engineering	567	Germany	824
		2014	1672	Robinson, G.E.	65	Chemistry	2004	Brazil	822
		2013	1580	Ellis, J.D.	64	Computer Science	1063	Italy	686
		2012	1547	Pettis, J.S.	56	Decision Sciences	88	Spain	610
		2011	1337	Higes, M.	55	Dentistry	61	Turkey	607
		2010	1250	Tarpy, D.R.	55	Earth and Planetary Sciences	195	Australia	587
		2009	1084	Ratnieks, F.L.W.	53	Economics, Econometrics and Finance	68	Iran	572
		2008	1033	Amdam, G.V.	50	Energy	175	Poland	530
				Chantawannakul, P.	47	Engineering	1454	Canada	516
				Le Conte, Y.	47	Environmental Science	1546	France	510
				Genersch, E.	44	Health Professions	105	Malaysia	484
				Grozinger, C.M.	44	Immunology and Microbiology	804	Japan	341
				Phipps, R.	44	Materials Science	376	Switzerland	292
				Gan, S.H.	41	Mathematics	411	Argentina	284
				Kryger, P.	40	Medicine	3141	Egypt	269
				Martín-Hernández, R.	40	Multidisciplinary	397	New Zealand	258
				Barron, A.B.	39	Neuroscience	269	Mexico	254
				Rinderer, T.E.	37	Nursing	431	South Korea	254
				Ansari, M.J.	36	Pharmacology, Toxicology and Pharmac	1048	South Africa	247
				Huang, Z.Y.	36	Physics and Astronomy	421	Saudi Arabia	228
				Abramson, C.I.	35	Psychology	102	Thailand	209
				Chen, Y.	35	Social Sciences	617	Greece	205
				Jerković, I.	35	Veterinary	474	Netherlands	192
				Rueppell, O.	34	Undefined	2	Belgium	183
				Nieh, J.C.	33			Portugal	177
				Pirk, C.W.W.	33			Croatia	173
				Tuberoso, C.I.G.	33			Pakistan	172

# Apiceuticals

## Exploring A New Generation Of Medicines

### Apiceuticals – Bee Venom

#### ACADEMIC ARTICLES ABOUT BEE VENOM

SOURCE : SCOPUS

Number of results : 1679

ACCESS TYPE	YEAR	AUTHOR NAME	SUBJECT AREA	COUNTRY		
Open Acc	402	2018	122 Park, K.K.	50 Agricultural and Biological Sciences	145 South Korea	289
Other	1277	2017	164 Han, S.M.	49 Arts and Humanities	1 United States	271
		2016	168 Ruëff, F.	28 Biochemistry, Genetics and Molecular Biology	414 Germany	166
		2015	144 Bae, H.	25 Chemical Engineering	25 China	129
		2014	181 Blank, S.	24 Chemistry	104 Brazil	83
		2013	184 Pak, S.C.	24 Computer Science	6 United Kingdo	80
		2012	150 Spillner, E.	24 Dentistry	1 Italy	76
		2011	165 Aberer, W.	22 Earth and Planetary Sciences	2 Australia	74
		2010	156 Przybilla, B.	22 Engineering	13 Switzerland	72
		2009	115 Jin, B.R.	21 Environmental Science	63 Poland	69
		2008	130 Lee, W.R.	21 Health Professions	3 Turkey	54
			An, H.J.	19 Immunology and Microbiology	356 Spain	53
			Kim, K.H.	19 Materials Science	23 France	51
			Chang, Y.C.	18 Mathematics	3 Austria	46
			Chen, J.	18 Medicine	966 India	43
			Ollert, M.	18 Multidisciplinary	13 Egypt	40
			Chen, J.	17 Neuroscience	111 Denmark	36
			Jakob, T.	17 Nursing	8 Japan	33
			Kim, J.Y.	17 Pharmacology, Toxicology and Pharmaceutics	323 Czech Republi	27
			Lee, K.G.	17 Physics and Astronomy	17 Canada	26
			Kokot, Z.J.	16 Psychology	5 Belgium	25
			Matysiak, J.	16 Social Sciences	6 Iran	25
			Sturm, G.J.	16 Veterinary	29 Netherlands	24

# Apiceuticals

## Exploring A New Generation Of Medicines

### Apiceuticals - Royal Jelly

#### ACADEMIC ARTICLES ABOUT ROYAL JELLY

##### SOURCE SCOPUS

Number of results : 875

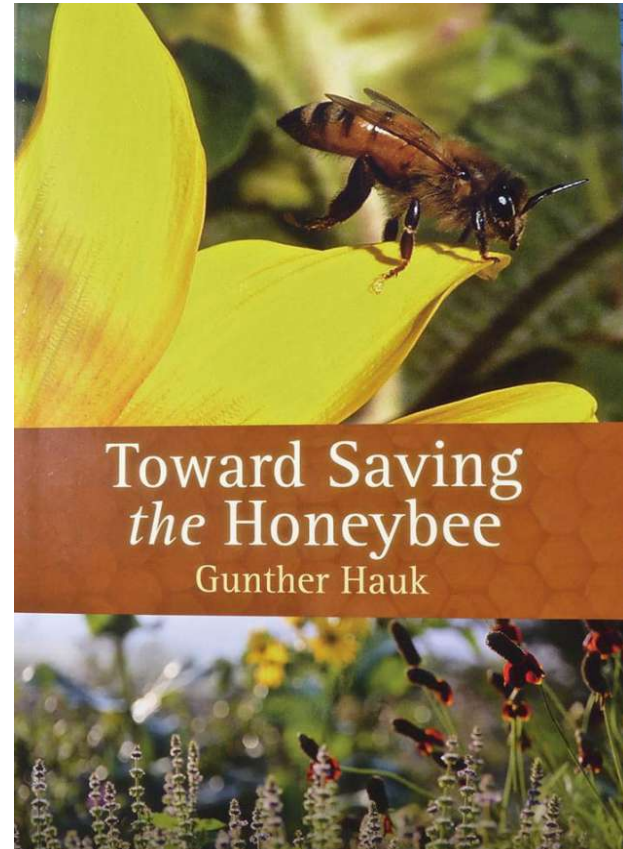
ACCESS TYPE	YEAR		AUTHOR NAME	SUBJECT AREA	COUNTRY				
Open Acc.	235	2019	1	Feng, M.	17	Agricultural and Biological Sciences	337	China	168
Other	640	2018	102	Li, J.	17	Arts and Humanities	3	Japan	119
		2017	96	Hu, F.L.	14	Biochemistry, Genetics and Molecular Biology	290	United States	88
		2016	94	Fang, Y.	13	Business, Management and Accounting	1	Turkey	61
		2015	100	Han, B.	12	Chemical Engineering	39	Iran	56
		2014	93	Yamaguchi, K.	12	Chemistry	156	Brazil	47
		2013	75	Buttstedt, A.	10	Computer Science	6	Egypt	41
		2012	77	Nejati, V.	10	Dentistry	2	Germany	40
		2011	70	Wu, L.	10	Earth and Planetary Sciences	3	Italy	32
		2010	43	Zeng, Z.J.	10	Energy	1	Australia	27
		2009	74	Andrițoiu, C.V.	9	Engineering	30	Spain	25
		2008	50	Najafi, G.	9	Environmental Science	42	Romania	23
				Zhao, J.	9	Health Professions	6	United Kingdom	22
				Zheng, H.Q.	9	Immunology and Microbiology	51	Poland	21
				Chinou, I.	8	Materials Science	8	France	19
				Faquinello, P.	8	Medicine	279	Greece	18
				Kubo, T.	8	Multidisciplinary	13	South Africa	17
				Moritz, R.F.A.	8	Neuroscience	15	South Korea	16
				Silici, S.	8	Nursing	52	Saudi Arabia	14
				Xue, X.	8	Pharmacology, Toxicology and Pharmaceutics	102	Canada	13
				Andrițoiu, V.	7	Physics and Astronomy	7	India	12
				Maleszka, R.	7	Psychology	1	Malaysia	12
				Sereia, M.J.	7	Social Sciences	6	Slovakia	12
				Wu, X.B.	7	Veterinary	30	Bulgaria	10
				Zhou, J.	7			Switzerland	10
				Casabianca, H.	6			Taiwan	10



# Apiceuticals

## Exploring A New Generation Of Medicines

Sustainable Medicine





# Apiceuticals

## Exploring A New Generation Of Medicines

Sustainable Medicine





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## Exploring A New Generation Of Medicines

### Sustainable Medicine





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## Exploring A New Generation Of Medicines

### Geographic Medicine ?

1. Antibiotic properties varies by climate
2. Anti MRSA properties of propolis in hot wet climate.
3. Anti trypanosomes in propolis collected by bees where there is Trypanosomiasis





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## Exploring A New Generation Of Medicines

### Discovering Geographic Medicine

PHYTOTHERAPY RESEARCH  
*Phytother. Res.* (2010)  
Published online in Wiley InterScience  
(www.interscience.wiley.com) DOI: 10.1002/ptr.3096

#### Antimethicillin-Resistant *Staphylococcus aureus* (MRSA) Activity of 'Pacific Propolis' and Isolated Prenylflavanones

Raghavendra Raghukumar<sup>1</sup>, Leila Vali<sup>2</sup>, Dave Watson<sup>3</sup>, Jan and Véronique Seidel<sup>1,\*</sup>

<sup>1</sup>Natural Products Research Laboratories, Strathclyde Institute of Pharmacy and Biomedical Sciences, Glasgow, UK

<sup>2</sup>Microbiology Laboratories, Strathclyde Institute of Pharmacy and Biomedical Sciences, Glasgow, UK

<sup>3</sup>Pharmaceutical Analysis Laboratories, Strathclyde Institute of Pharmacy and Biomedical Sciences, Glasgow, UK

<sup>4</sup>Natures Laboratory Ltd, Bee Vital & Herbal Apothecary, 3b Enterprise Way, Whitby YO22 5JR, UK

The need to discover and develop alternative therapies to treat multi-resistant (MRSA) infections is timely. This study was undertaken to purify and identify the active components of propolis, a natural product from the beehive traditionally used for its medicinal properties. A crude extract of propolis originating from the Solomon Islands was subjected to further investigation, and subsequent purification work on this crude extract led to the isolation of compounds 1–4, whose structures were confirmed by 1D- and 2D-NMR, MS and by comparison with the literature. Compound 1 (1), propolin C (2), propolin D (3), and propolin C (4). This study identifies the 'Pacific propolis' and the presence of prenylflavanones in the propolis. Compound 1 (1) showed moderate activity against MRSA (MIC 8–16 mg/L) and propolin C (4) (MIC 31.25–2500 mg/L).

**Keywords:** antibacterial activity; methicillin-resistant *Staphylococcus aureus*; propolis

PHYTOTHERAPY RESEARCH  
*Phytother. Res.* 22, 1256–1263 (2008)  
Published online 20 June 2008 in Wiley InterScience  
(www.interscience.wiley.com) DOI: 10.1002/ptr.2480

#### Comparative Study of the Antibacterial Activity of Propolis from Different Geographical and Climatic Zones

Véronique Seidel<sup>1</sup>, Elham Peyfoon<sup>2</sup>, David G. Watson<sup>2,\*</sup> and James Fearnley<sup>3</sup>

<sup>1</sup>Natural Products Research Laboratories, Strathclyde Institute of Pharmacy and Biomedical Sciences, University of Strathclyde, 27 Taylor Street, Glasgow G4 0NR, UK

<sup>2</sup>Pharmaceutical Analysis Laboratories, Strathclyde Institute of Pharmacy and Biomedical Sciences, University of Strathclyde, 27 Taylor Street, Glasgow G4 0NR, UK

<sup>3</sup>BeeVital & Herbal Apothecary, Goathland, Whitby YO22 5JR, UK

Propolis is a natural substance produced by honeybees upon collection and transformation of resins and exudates from plants. Comparative studies on propolis collected from a wide range of countries are crucial for linking its provenance to antibacterial activity and thus ensuring that the beneficial properties of propolis are used more efficiently by the general public. This study reports the *in vitro* screening of ethanol extracts of propolis ( $n = 40$ ), collected from a wide range of countries within the tropical, subtropical and temperate zones, and on the comparison of their activity against a range of Gram-positive and Gram-negative bacteria using a broth microdilution assay. The results obtained revealed that propolis extracts were mostly active against Gram-positive bacteria. The samples were subjected to principal component analysis (PCA) in order to model their activity against Gram-positive microorganisms. Three distinct clusters were distinguished in the PCA mapping based on MIC values, categorizing samples with strong (MIC range 3.9–31.25 mg/L), moderate (MIC range 31.25–2500 mg/L) and weak antibacterial activity or inactivity (MIC  $\geq$  500 mg/L only). It is hypothesized that for samples of tropical provenance differences in the activity profiles may depend on the climatic characteristics of the collection sites. High antibacterial activity was observed for samples from locations characterized by a wet-tropical rainforest-type climate. Copyright © 2008 John Wiley & Sons, Ltd.

**Keywords:** antibacterial activity; climatic zones; principal component analysis; propolis

#### New Anti-trypanosomal Active Prenylated Compounds From African Propolis

Sultan Almutairi,<sup>[a]</sup> Ben Eapen,<sup>[a]</sup> Sai Maneesha Chundi,<sup>[a]</sup> Adnan Akhalil,<sup>[a]</sup> Weam Sihiri,<sup>[a]</sup> Carol Clements,<sup>[a]</sup> James Fearnley,<sup>[b]</sup> David G. Watson,<sup>[a],\*</sup> and RuAngelie Edrada-Ebel<sup>[a],\*</sup>

**Keywords:** Propolis / Geranylated Stilbene / Prenylated Propolone / Antitrypanosomal Activity / NMR / HRESIMS

New prenylated compounds (1, 2, and 3) were isolated from African propolis and NMR spectroscopy. Compounds exhibited moderate to strong activity against *Trypanosoma brucei*. The structures were determined by HRESIMS.

Propolis is composed of beeswax and plant exudates of various plants which are carried to the hive then used to seal and protect the hive. It is used as an anti-infective folk remedy for a variety of ailments. Propolis has been shown to be

#### Results and Discussion

Compounds 1, 2, and 3, as shown in Figure 1, were isolated from ethyl acetate extracts of African propolis by a combination of medium pressure liquid chromatography on silica gel followed by high pressure liquid chromatography at the semi-preparative scale, again on silica gel. Compounds 1 and 2 were isolated from a Ghanaian sample while compound 3 was obtained from a propolis sample collected from Cameroon. Elemental composition for the

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### How Does Propolis Work for the Honey Bee

#### *Bacharis dracunculifolia* story



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### Discovering Geographic Medicine

TEMPERATE  
ZONE

STRONGER  
ANTIOXIDANT  
ACTIVITY

DOMINATED BY  
FLAVONOIDS

MEDITERRANEAN  
ZONE

MORE BALANCED  
ANTIOXIDANT  
ANTIBIOTIC  
ACTIVITY

BALANCE BETWEEN  
FLAVONOIDS  
PHENOLICS

SUB TROPICAL  
ZONE

STRONGER  
ANTIMICROBIAL  
ACTIVITY

DOMINATED BY  
PHENOLICS





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## Exploring A New Generation Of Medicines

# BeePharma



## Local Help for Local Health

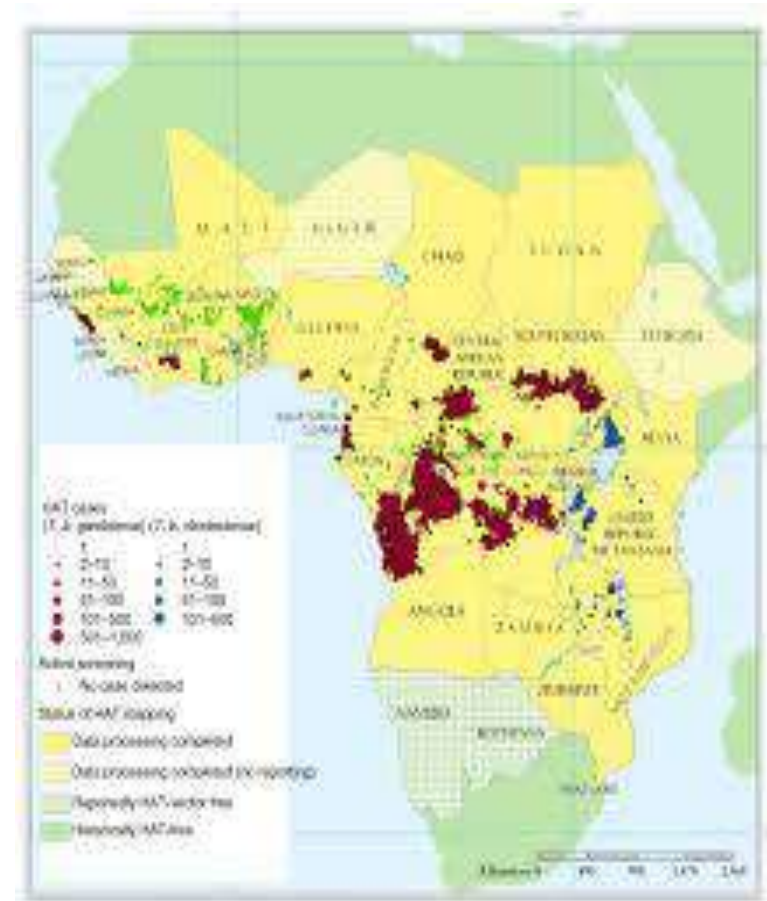
# Apiceuticals

## Exploring A New Generation Of Medicines

**Malaria** is a mosquito-borne infectious disease of humans and other animals caused by parasitic protozoans (a type of unicellular microorganism) of the genus *Plasmodium*

**Leishmania** is a genus of trypanosomatid protozoa and is the parasite responsible for the disease leishmaniasis

**Trypanosomiasis** or **trypanosomosis** is the name of several diseases in vertebrates caused by parasitic protozoan trypanosomes of the genus *Trypanosoma*





# Apiceuticals

## Exploring A New Generation Of Medicines



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### Threefold Health from the Honey Bee

1. Supporting  
Economic & Environmental Health
2. Supporting  
Physical and Social Health and Wellbeing
3. Supporting  
Emotional and Spiritual Wellbeing



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## Exploring A New Generation Of Medicines

### Bringing the Science together





# Apiceuticals

## Exploring A New Generation Of Medicines





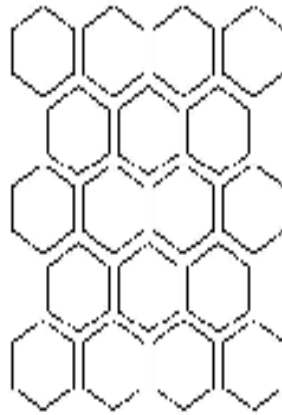


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## Exploring A New Generation Of Medicines

Bringing the Science together

**IPRG**  
International  
Propolis Research Group





# Apiceuticals

## Exploring A New Generation Of Medicines

### Propolis in Human & Bee Health 2018

*Sofia, Bulgaria September 28 - 29 2018*



On 28th & 29th September 2018 ARC will be co-hosting the 2nd International Conference on Propolis in Human & Bee Health in Sofia, Bulgaria.



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PROPOLIS  
IN HUMAN AND BEE  
HEALTH CONFERENCE  
*ISTANBUL 2020*

24 -26 September 2020

[www.propolisconference.com](http://www.propolisconference.com)

[info@propolisconference2020.com](mailto:info@propolisconference2020.com)

24 - 26 SEPTEMBER 2020  
[www.propolisconference2020.com](http://www.propolisconference2020.com)  
[info@propolisconference2020.com](mailto:info@propolisconference2020.com)

**IPRG**  
International  
Propolis Research Group





# Apiceuticals

## Exploring A New Generation Of Medicines

## Setting Standards

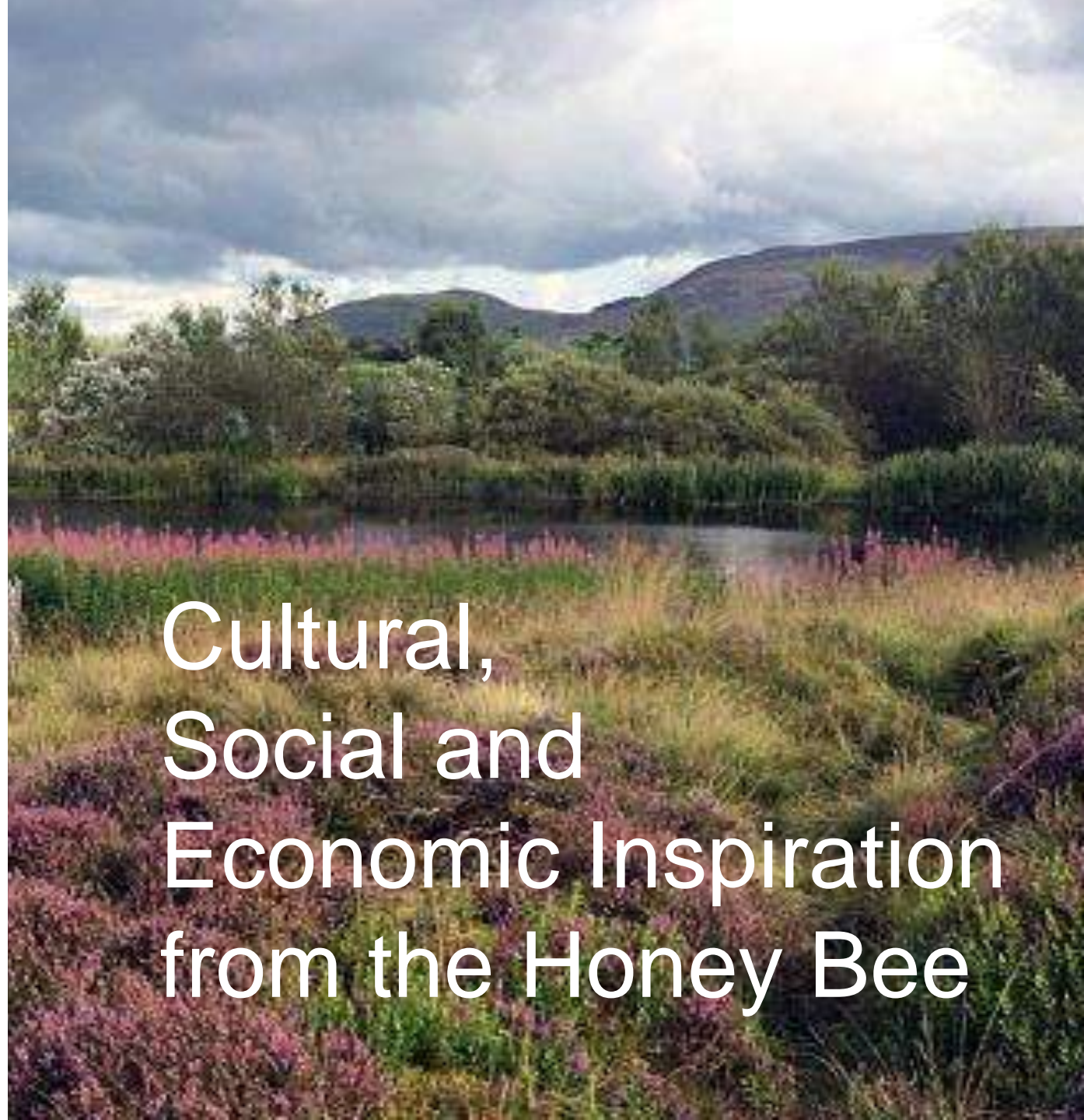


# The BeeArc Project

Inspiration from the HoneyBee  
Social, Cultural and Economic



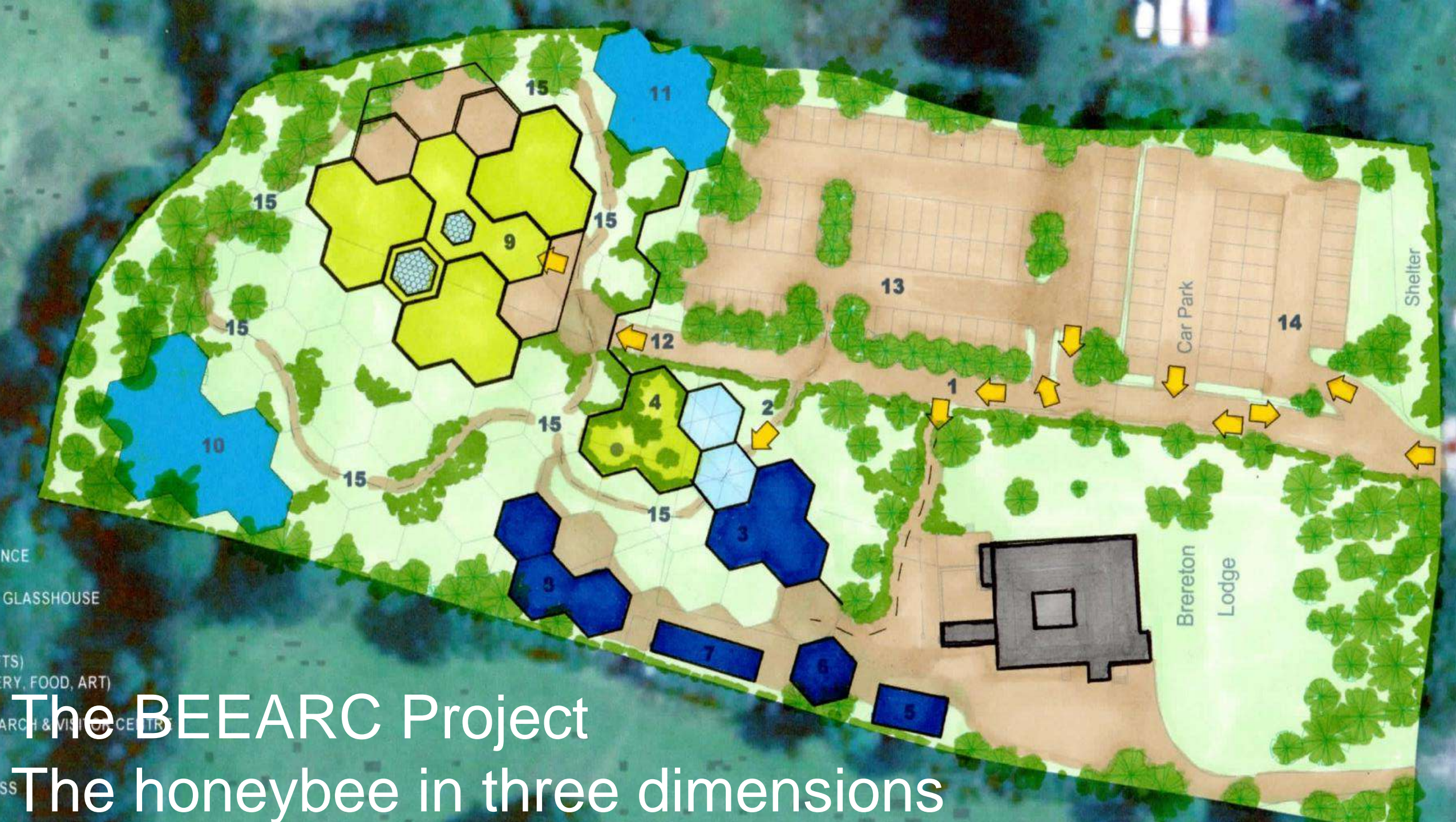
Cultural,  
Social and  
Economic Inspiration  
from the Honey Bee





# The BEEARC Project

## The honeybee in three dimensions





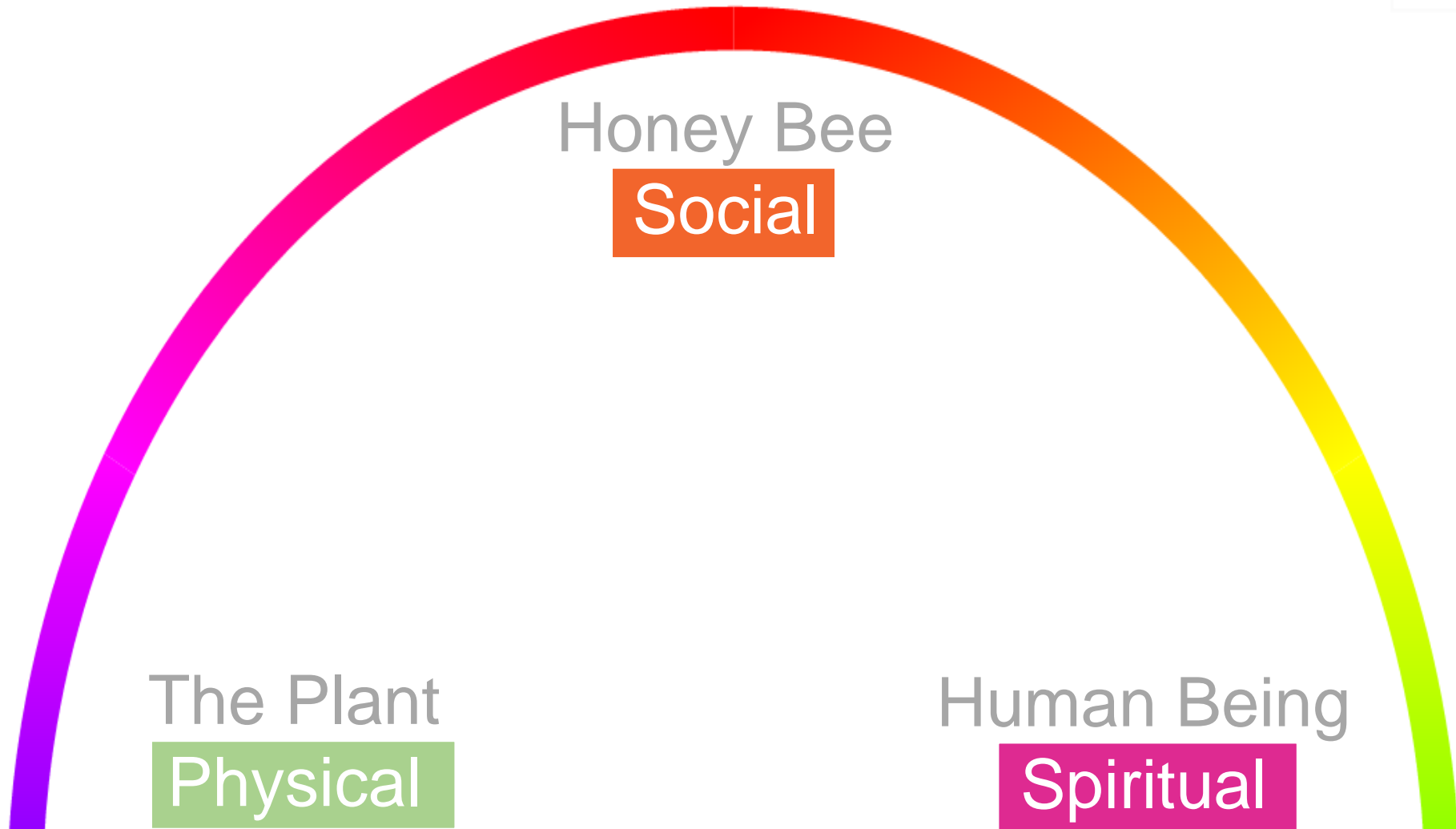


# Apiceuticals

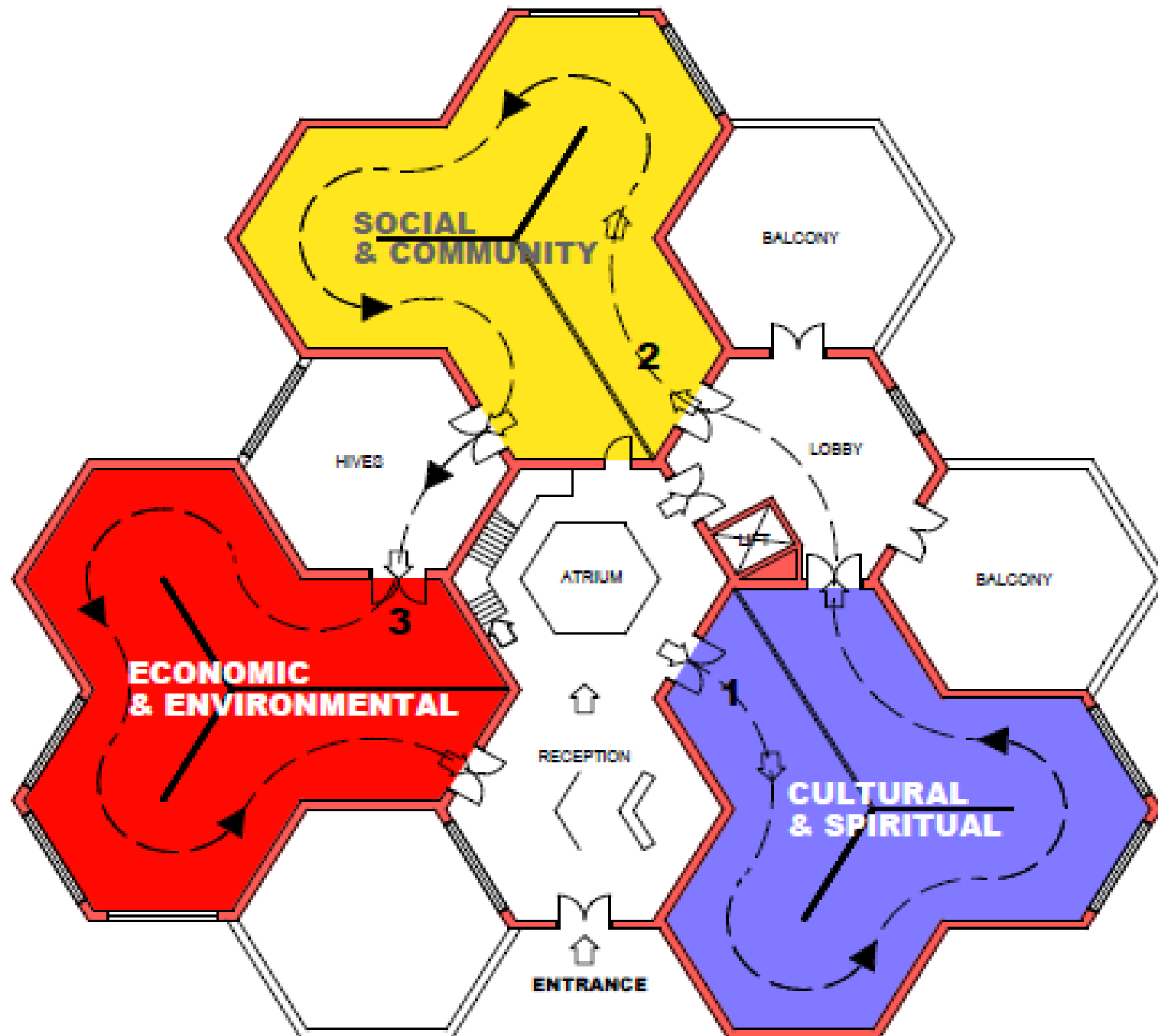
## Exploring A New Generation Of Medicines



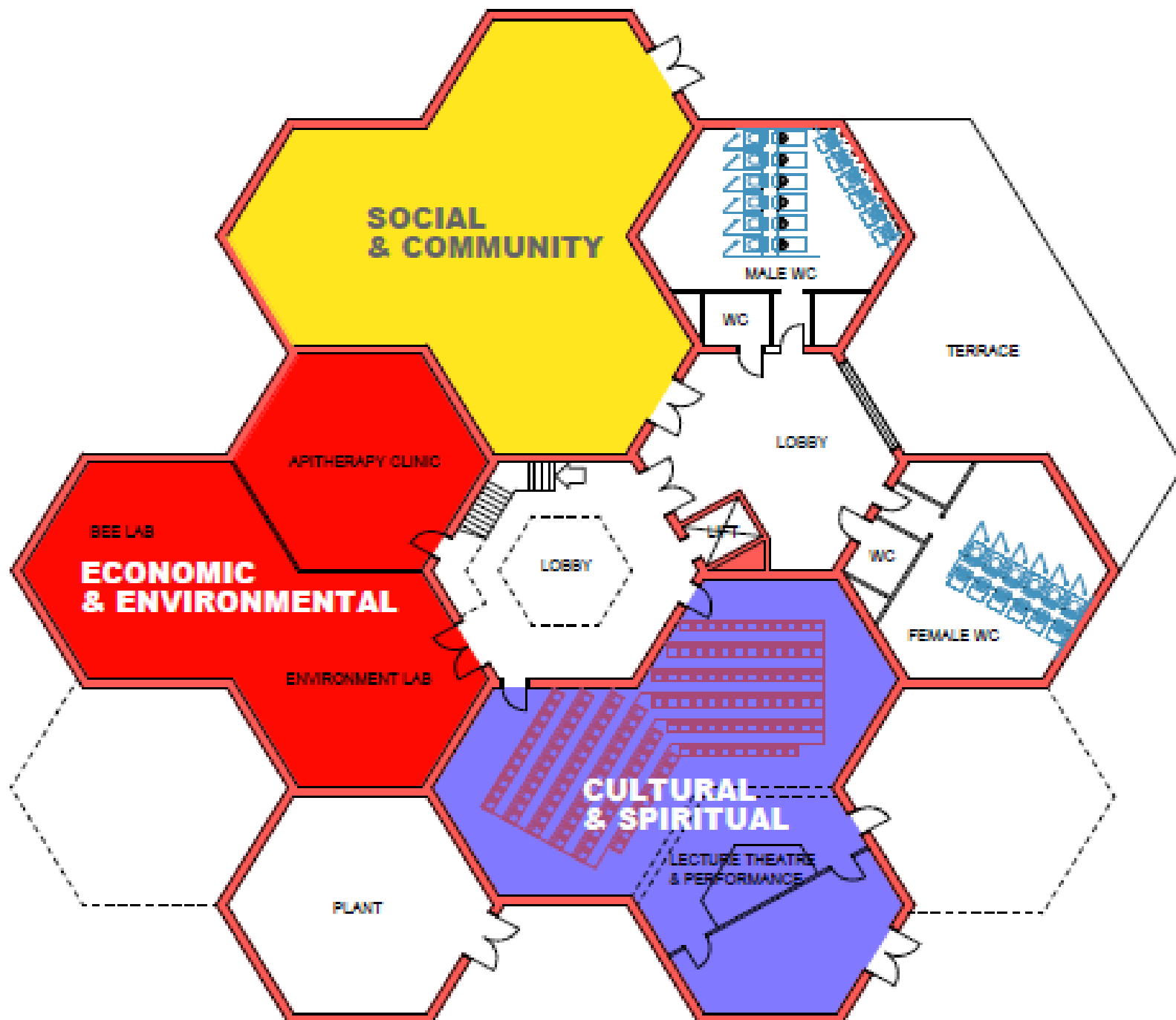
Result



# BeeArc Exhibition Centre



# BeeArc Research Centre



# Apiceuticals

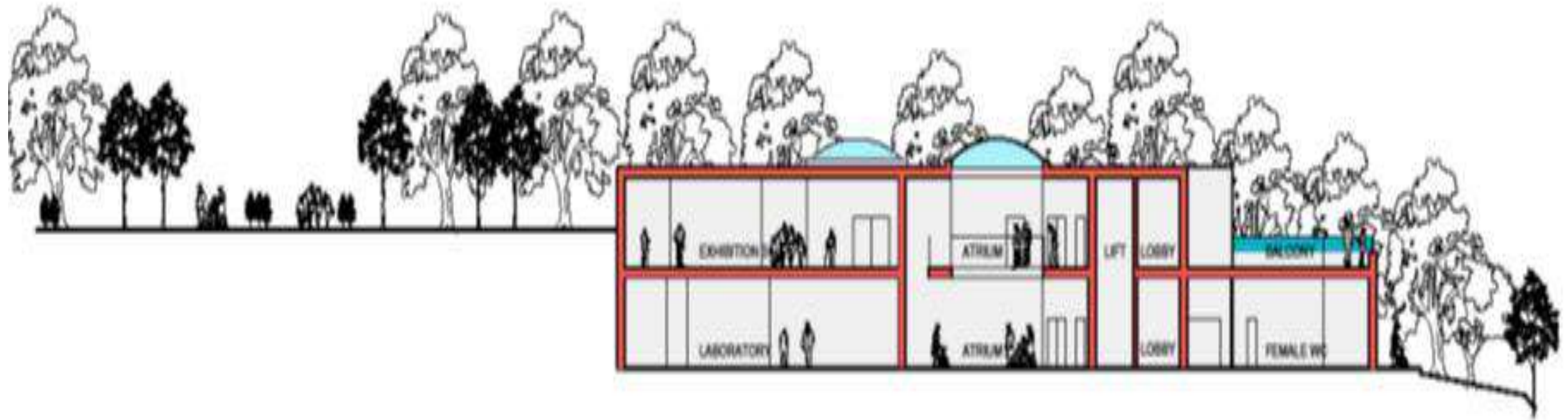
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**APICEUTICAL RESEARCH CENTRE  
CONCEPT ELEVATION TO ENTRANCE**

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**APICEUTICAL RESEARCH CENTRE  
CONCEPT SECTION BUILT INTO GROUND**