



UN ESPACIO INTERDISCIPLINARIO

# METODOLOGÍA DE BIOMÍMESIS

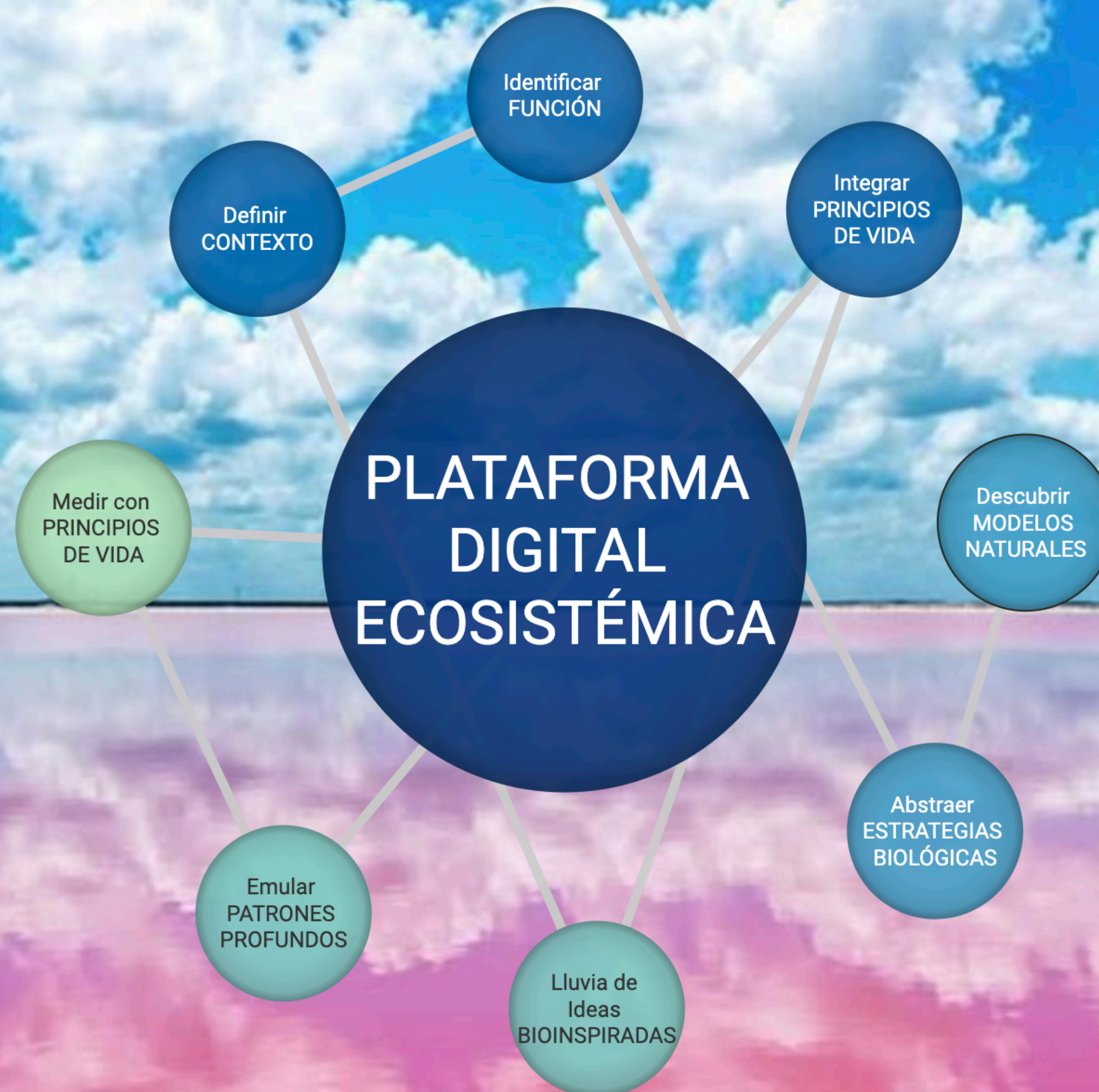


INSPIRACIÓN NATURAL

# DE LA BIOLOGÍA AL DISEÑO



# De la Biología al Diseño



# CONTEXTO



salt erosion coastal locations

wind control

building shapes that would maximize space used for residential or office use

homes that could capture moisture in air and store water

water collection

urban planning

pest control

protection

white roofs

creating shade in architectural membranes

temperature control

energy conservation

light coloured vegetation used for green roofs, like prairie grass

creating shade in clothes

wall membranes

creating microclimates

temperature control

architecture that is more solar conscious, south side diagonal facades.

architecture with semi-permeable membrane that will collect atmospheric moisture and act as an insulating layer from sun and wind.

water collection.

environment control.

solar power

solar panels that follow the sun's direction, without any mechanisms, letting the temperature difference between the cool and warm sides direct the panels.

bricks that would have pores close and open depending on temperature

conserving energy

energy conservation

roofs with white material or painted

light coloured vegetation used in green roofs

capturing co2 organically and transforming it for later use or disposal, using the cacti photosynthesis process.

co2 capturing technology.

energy conservation.

integrated technology.

saving materials.

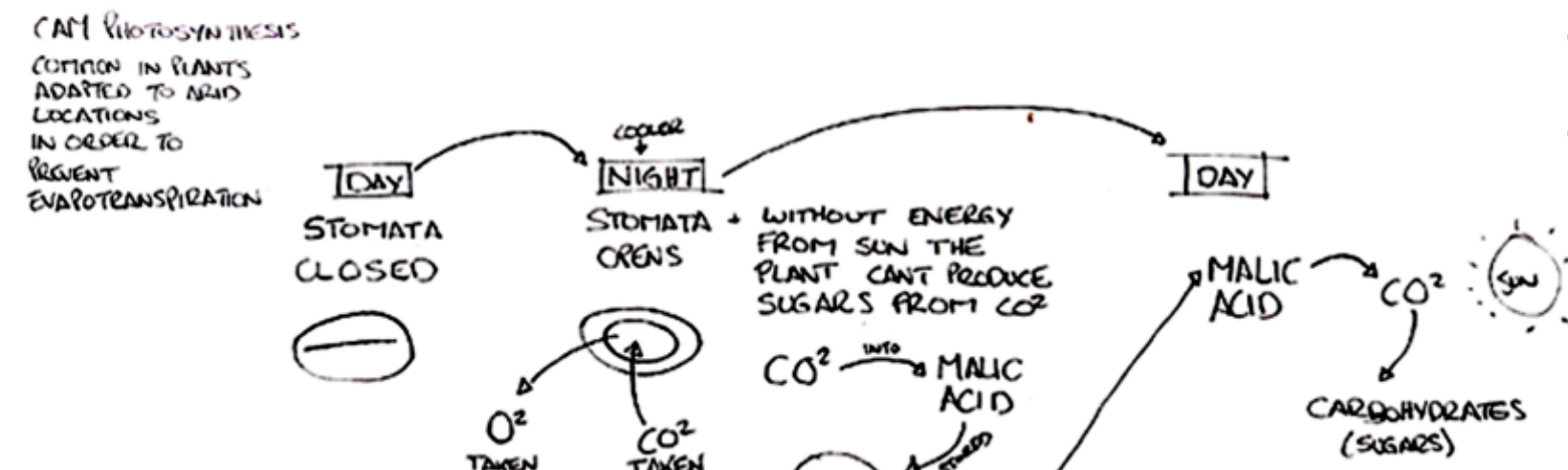
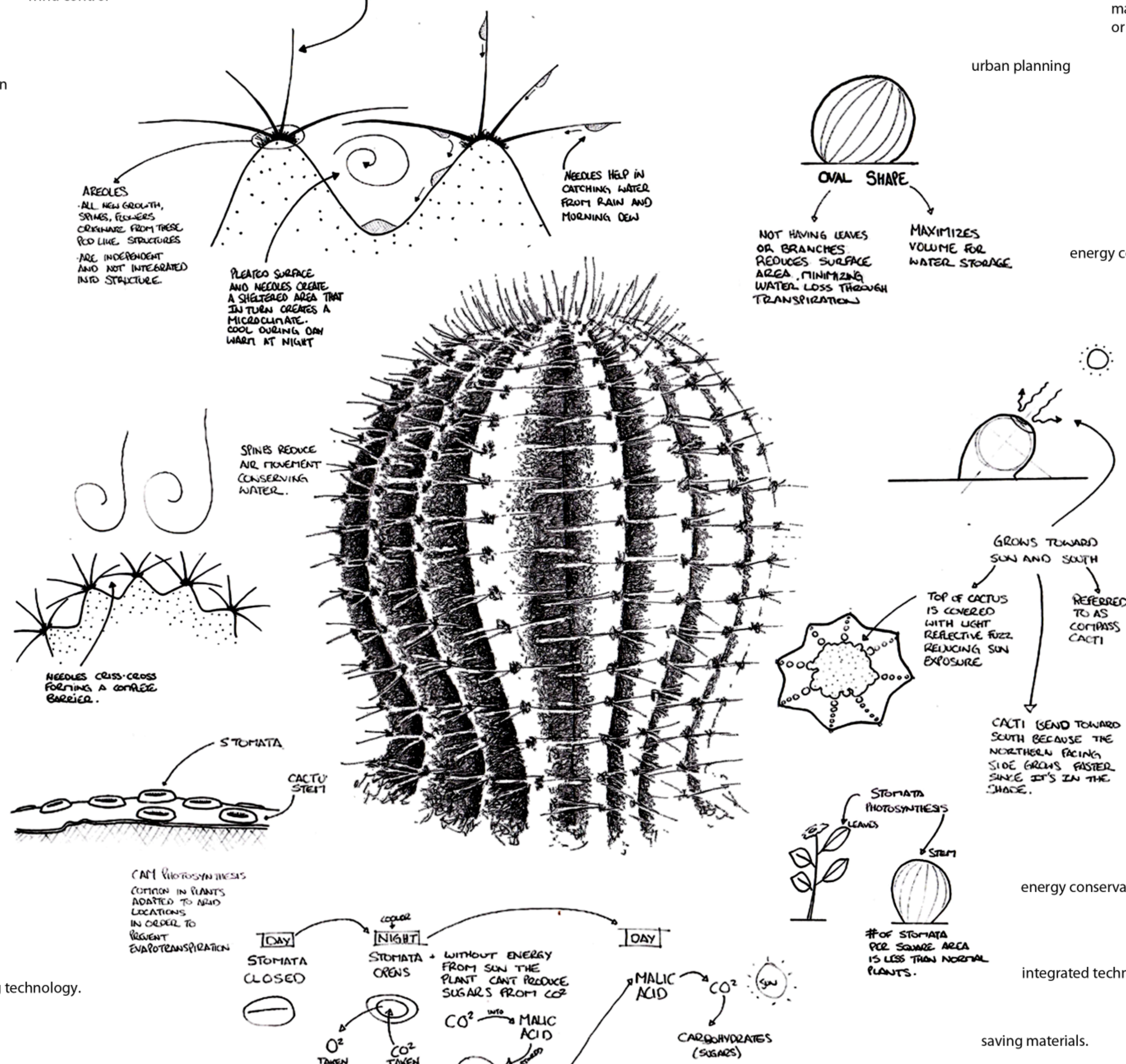
energy storing battery based upon vacuole cellular membrane

energy storage.

energy conservation.

integrated technology.

saving materials.



a sail boat doesn't need a sail, it is the sail.

a city doesn't need buildings, the city is a building.

salt erosion  
erosion prevention

coastal locations

wind control

homes that could  
capture moisture  
in air and store water

water collection

THE NEEDLES  
ACT AS A PROTECTIVE  
BARRIER FROM PREDATORS,  
BEING STEPPED ON AND  
FROM BLOWING SAND

pest control

protection

creating shade  
in architectural  
membranes

temperature control

creating shade  
in clothes

wall membranes

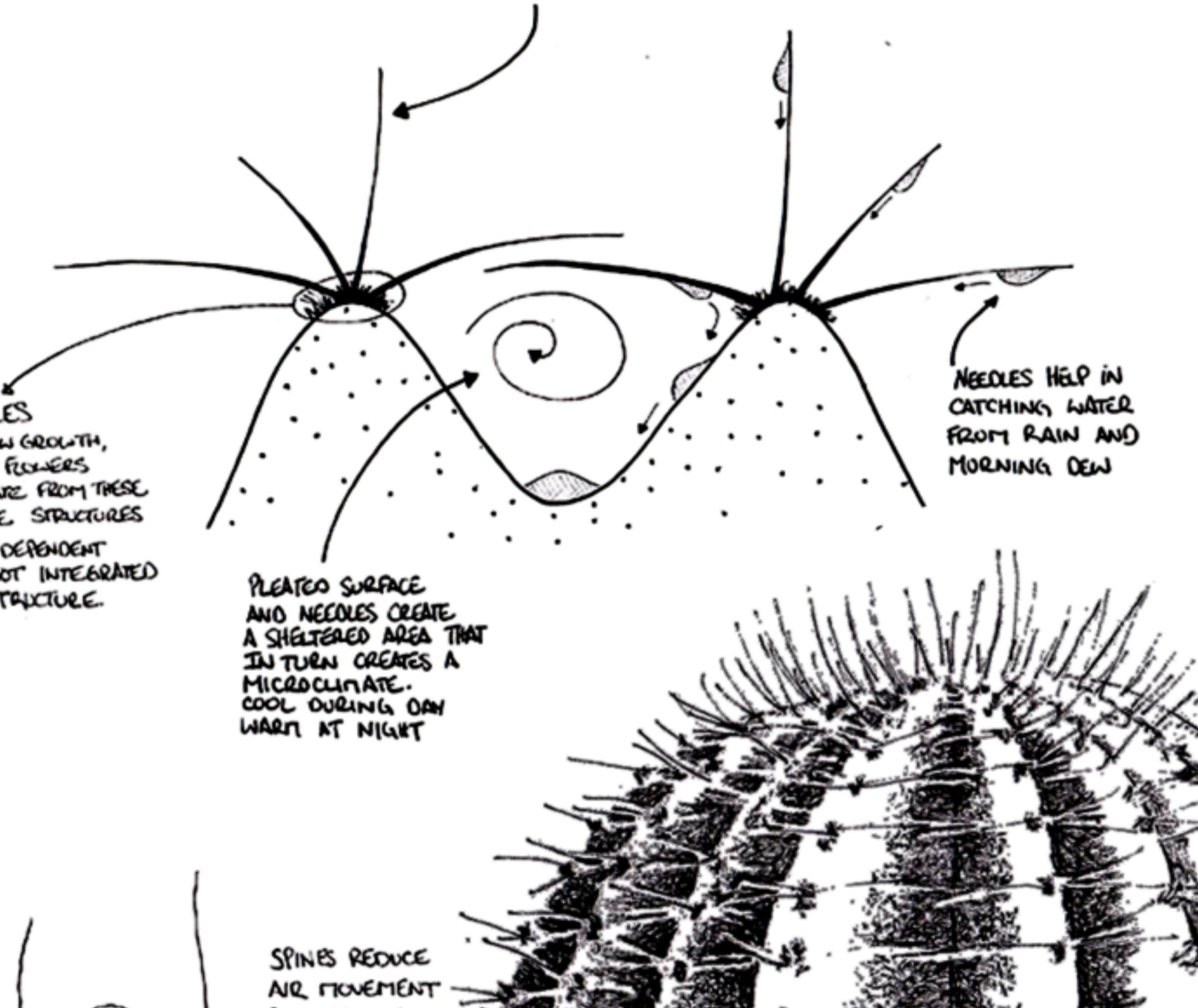
creating microclimates

AREOLES  
- ALL NEW GROWTH,  
SPINES, FLOWERS  
ORIGINATE FROM THESE  
POD LIKE STRUCTURES  
- ARE INDEPENDENT  
AND NOT INTEGRATED  
INTO STRUCTURE.

PLEATED SURFACE  
AND NEEDLES CREATE  
A SHELTERED AREA THAT  
IN TURN CREATES A  
MICROCLIMATE.  
COOL DURING DAY  
WARM AT NIGHT

NEEDLES HELP IN  
CATCHING WATER  
FROM RAIN AND  
MORNING DEW

SPINES REDUCE  
AIR MOVEMENT



architecture with semi-permeable membrane that will collect atmospheric moisture and act as an insulating layer from sun and wind.

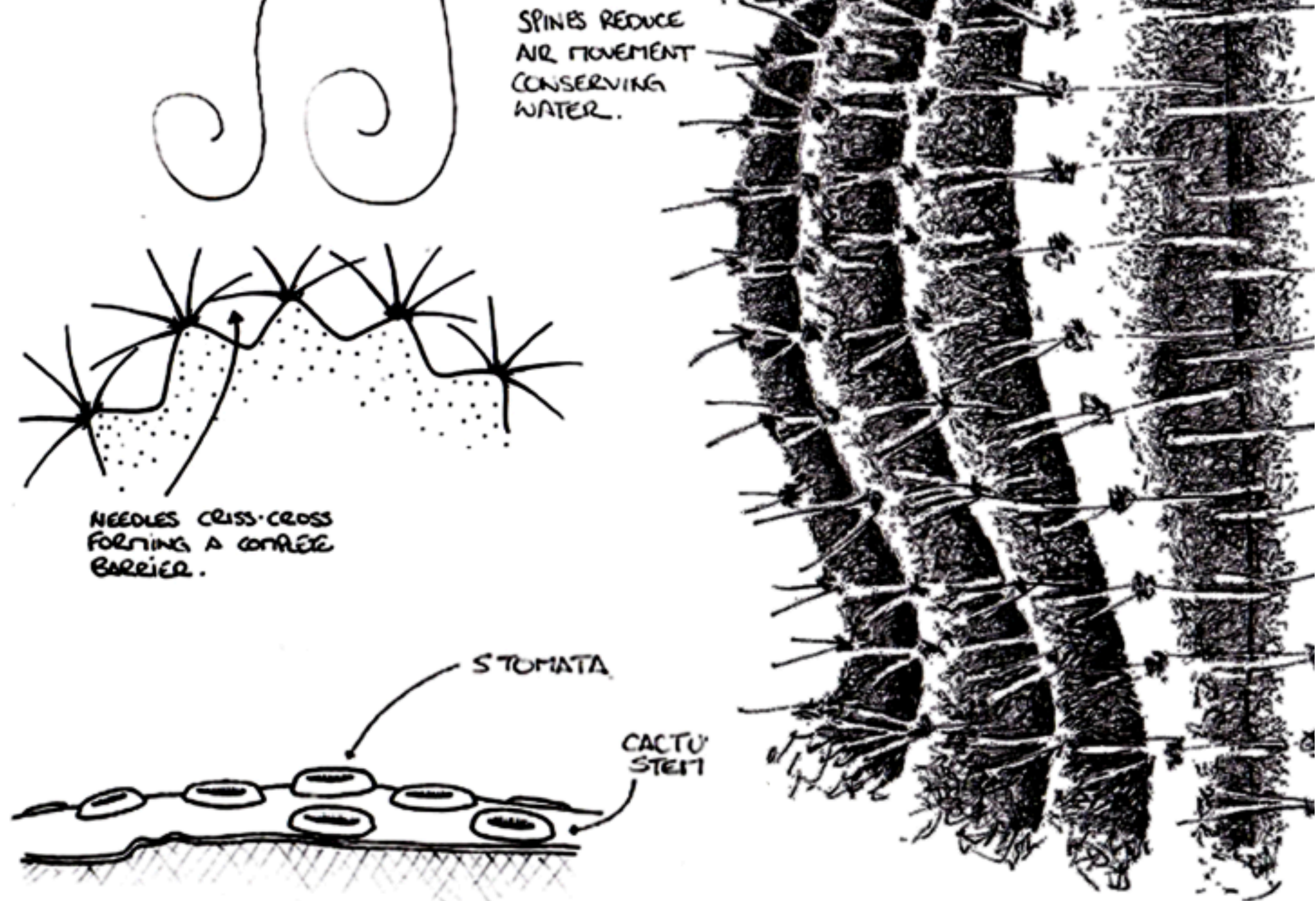
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capturing co2 organically and transforming it for later use or disposal, using the cacti photosynthesis process.

co2 capturing technology.



CAM PHOTOSYNTHESIS  
COMMON IN PLANTS ADAPTED TO ARID LOCATIONS IN ORDER TO PREVENT EVAPOTRANSPIRATION

DAY  
STOMATA CLOSED



COOLER  
NIGHT  
STOMATA OPENS



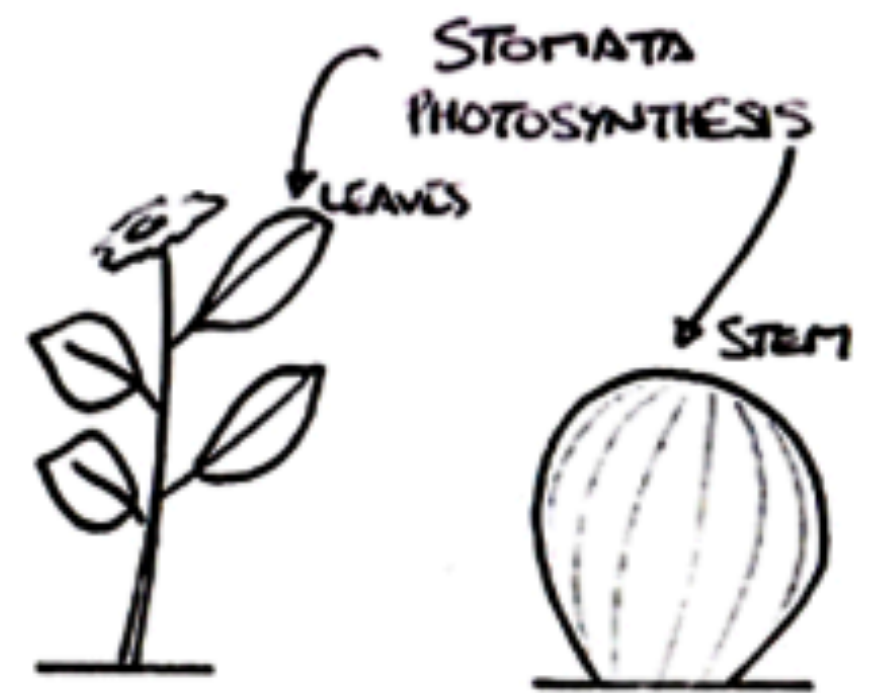
WITHOUT ENERGY FROM SUN THE PLANT CANT PRODUCE SUGARS FROM CO2

CO2 INTO MALIC



CACTI BEND TOWARD SOUTH BECAUSE THE NORTHERN FACING SIDE GROWS FASTER SINCE IT'S IN THE SHADE.

light coloured vegetation used in green roofs



STOMATA PHOTOSYNTHESIS LEAVES STEM # OF STOMATA PER SQUARE AREA IS LESS THAN NORMAL PLANTS.

energy conservation.

integrated technology.

saving materials.

structural membranes, eg. bricks, equipped with stomata like openings. With the heat they would expand and close not allowing hot air into the structure, and with the cool air it the openings would contract and open to allow cool air in.

sleeping bag style outer layer for the winter, single or multiple people, no extremities and you can walk with it on.

a sail boat doesn't need a sail, it is the sail.

a city doesn't need buildings, the city is a building.



ENERGY THE PLANT PRODUCE FROM CO2

MALIC ACID

MALIC ACID

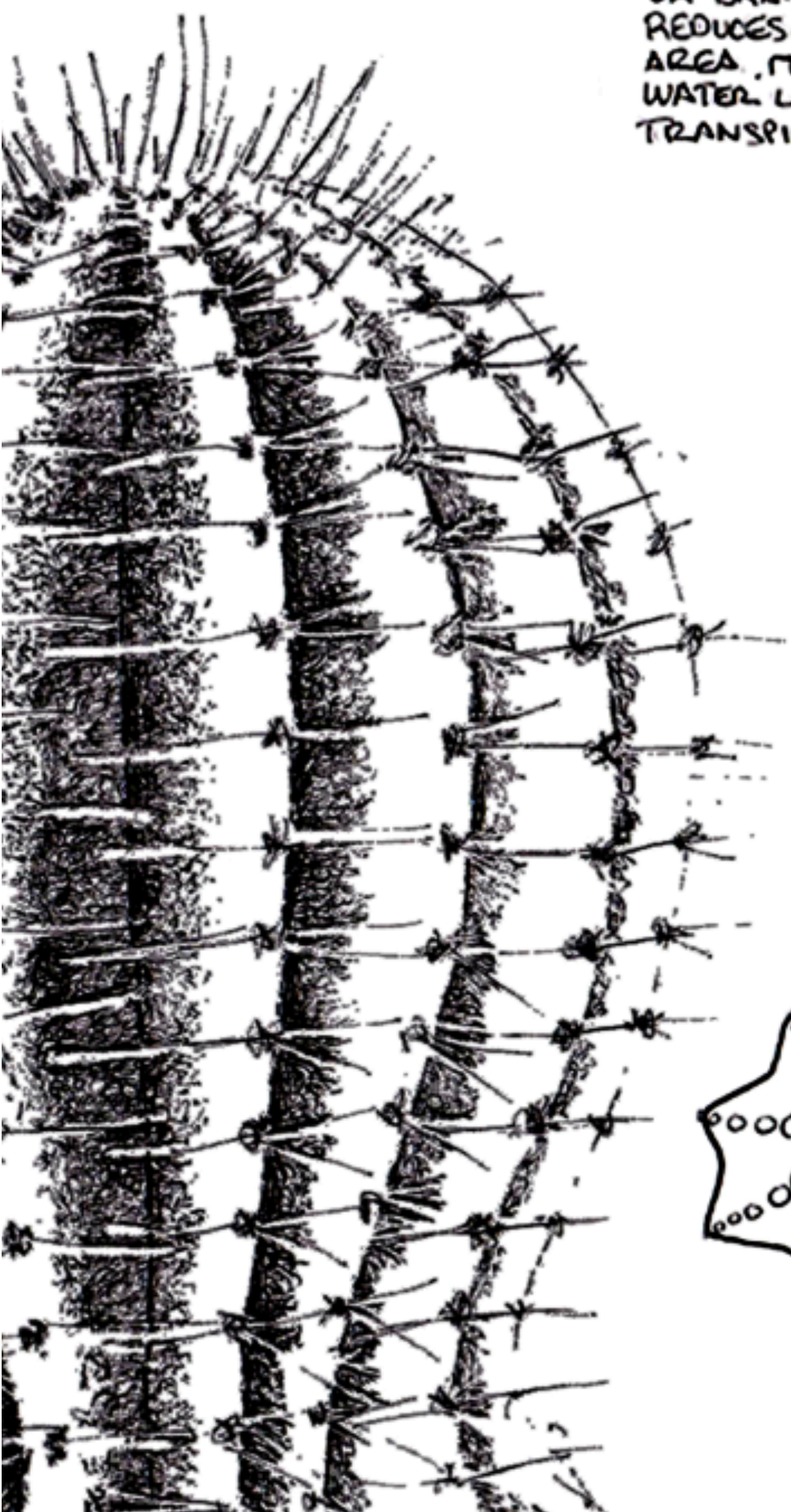
CO2

CARBOHYDRATES (SUGARS)

DAY





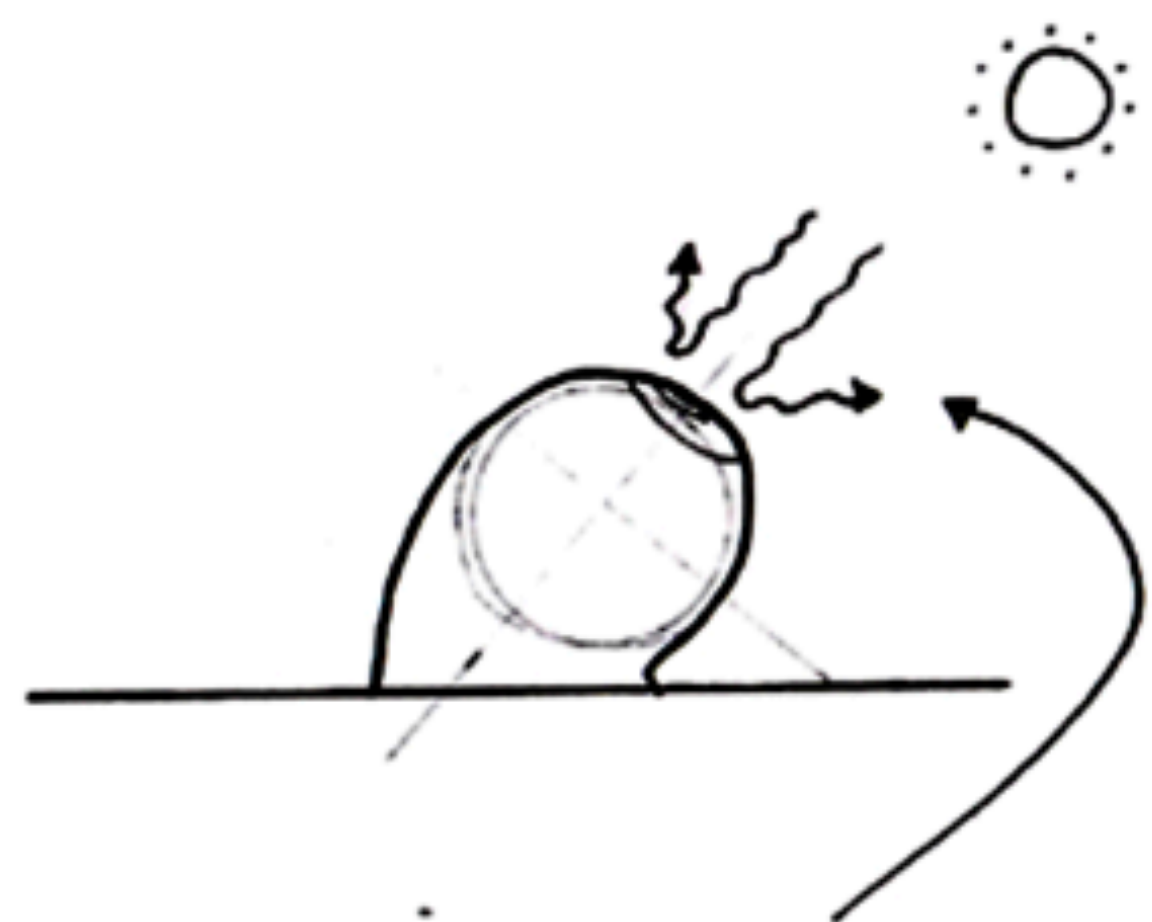


NOT HAVING LEAVES OR BRANCHES REDUCES SURFACE AREA, MINIMIZING WATER LOSS THROUGH TRANSPIRATION

MAXIMIZES VOLUME FOR WATER STORAGE

energy conservation

light coloured vegetation used for green roofs, like prairie grass



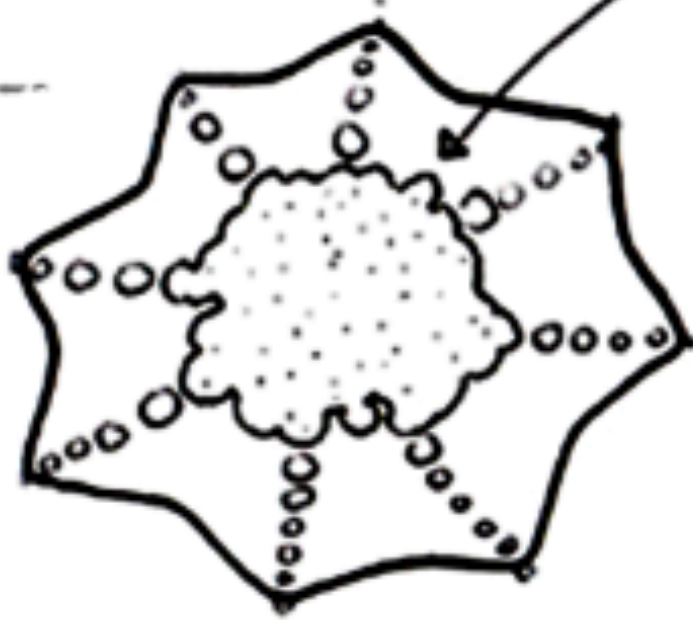
temperature control

architecture that is more solar conscious, south side diagonal facades.

solar power

solar panels that follow the sun's direction, without any mechanisms, letting the temperature difference between the cool and warm sides direct the panels.

GROWS TOWARD SUN AND SOUTH



TOP OF CACTUS IS COVERED WITH LIGHT REFLECTIVE FUZZ REDUCING SUN EXPOSURE

REFERRED TO AS COMPASS CACTI

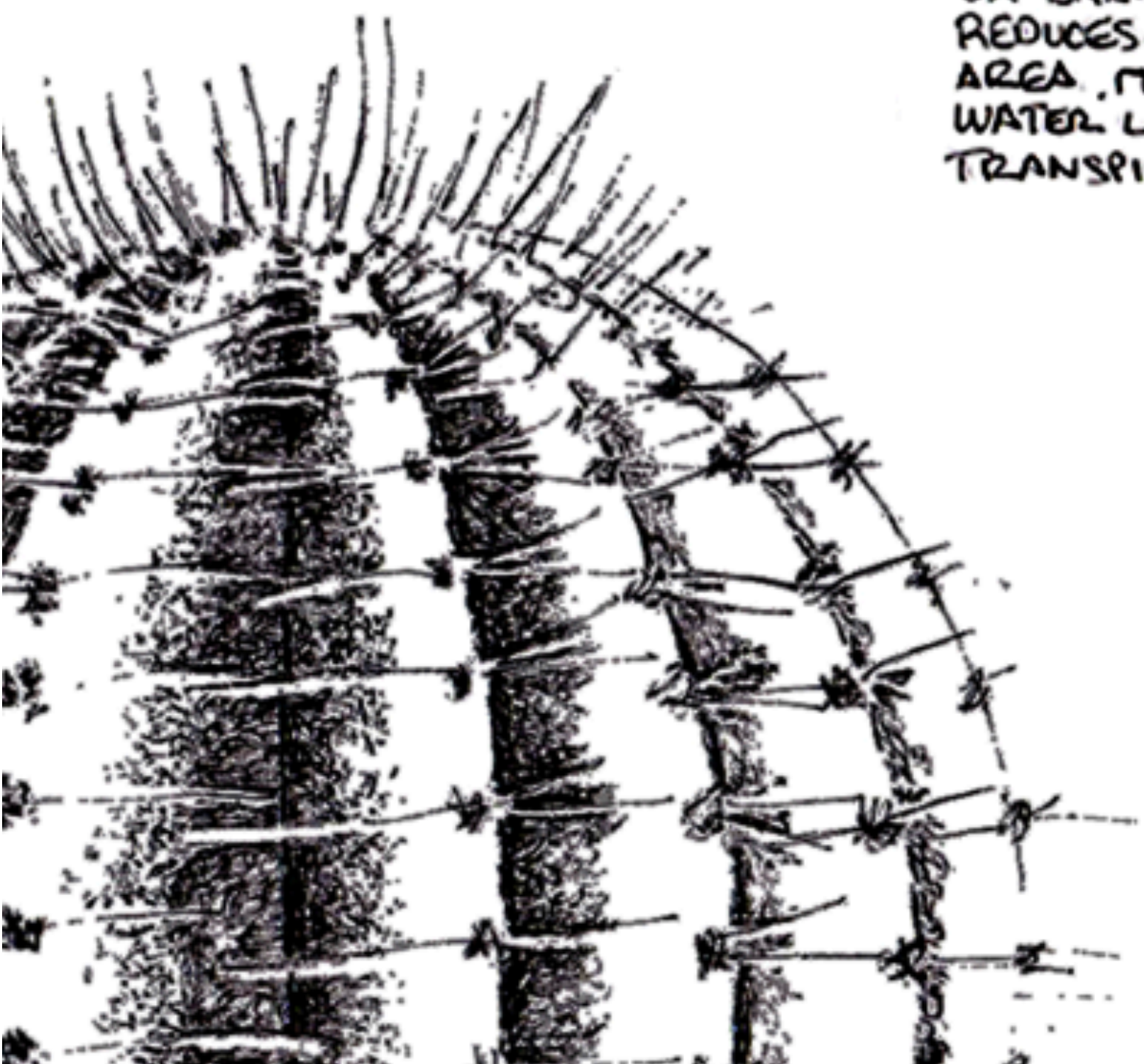
energy conservation

roofs with white material or painted

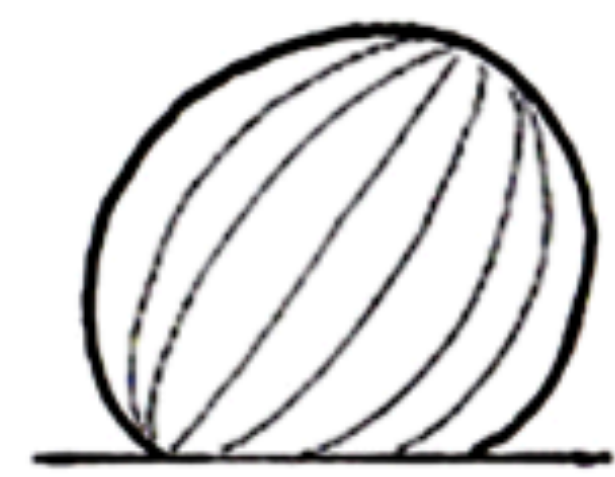
light coloured vegetation used in green roofs

CACTI BEND TOWARD SOUTH BECAUSE THE NORTHERN FACING SIDE GROWS FASTER SINCE IT'S IN THE SHADE.

STOMATA



urban planning



OVAL SHAPE

NOT HAVING LEAVES OR BRANCHES REDUCES SURFACE AREA, MINIMIZING WATER LOSS THROUGH TRANSPIRATION

MAXIMIZES VOLUME FOR WATER STORAGE

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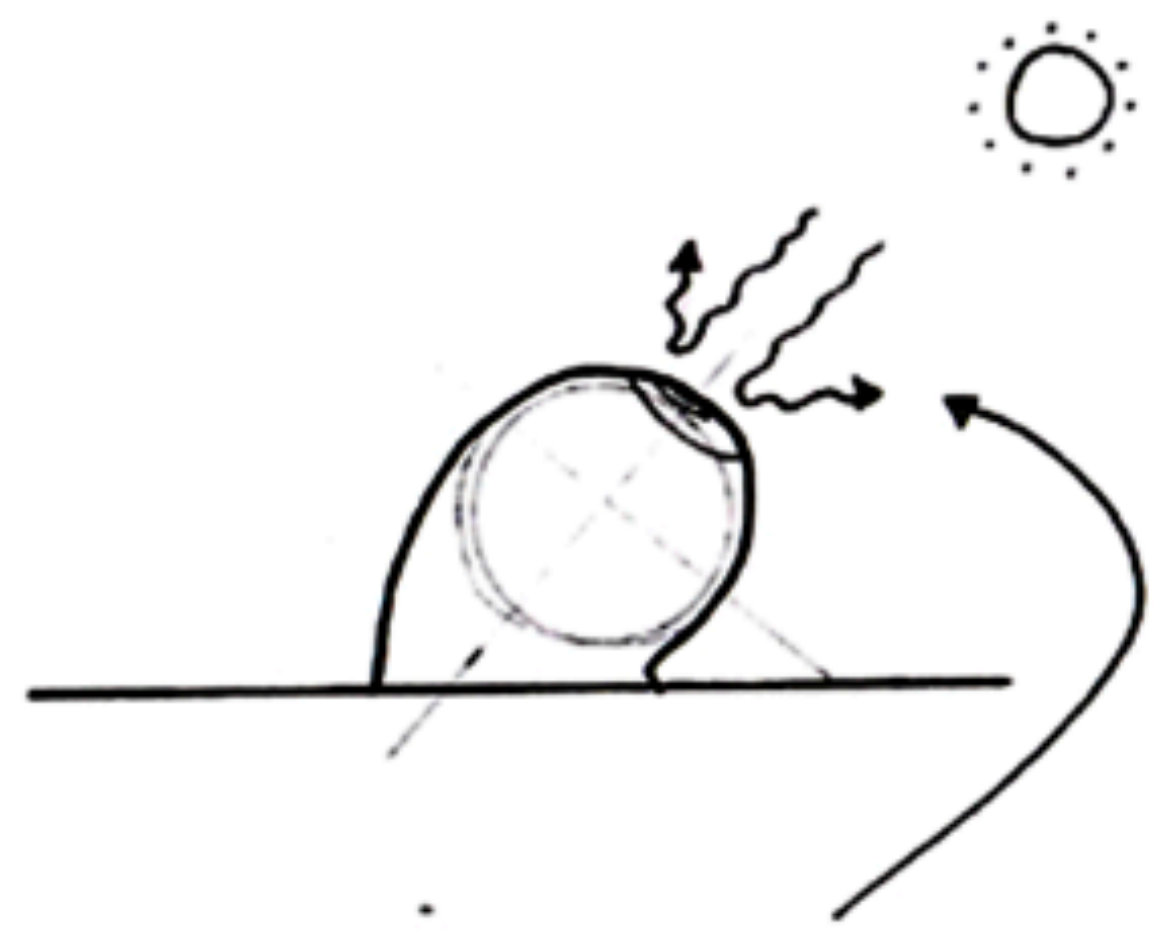
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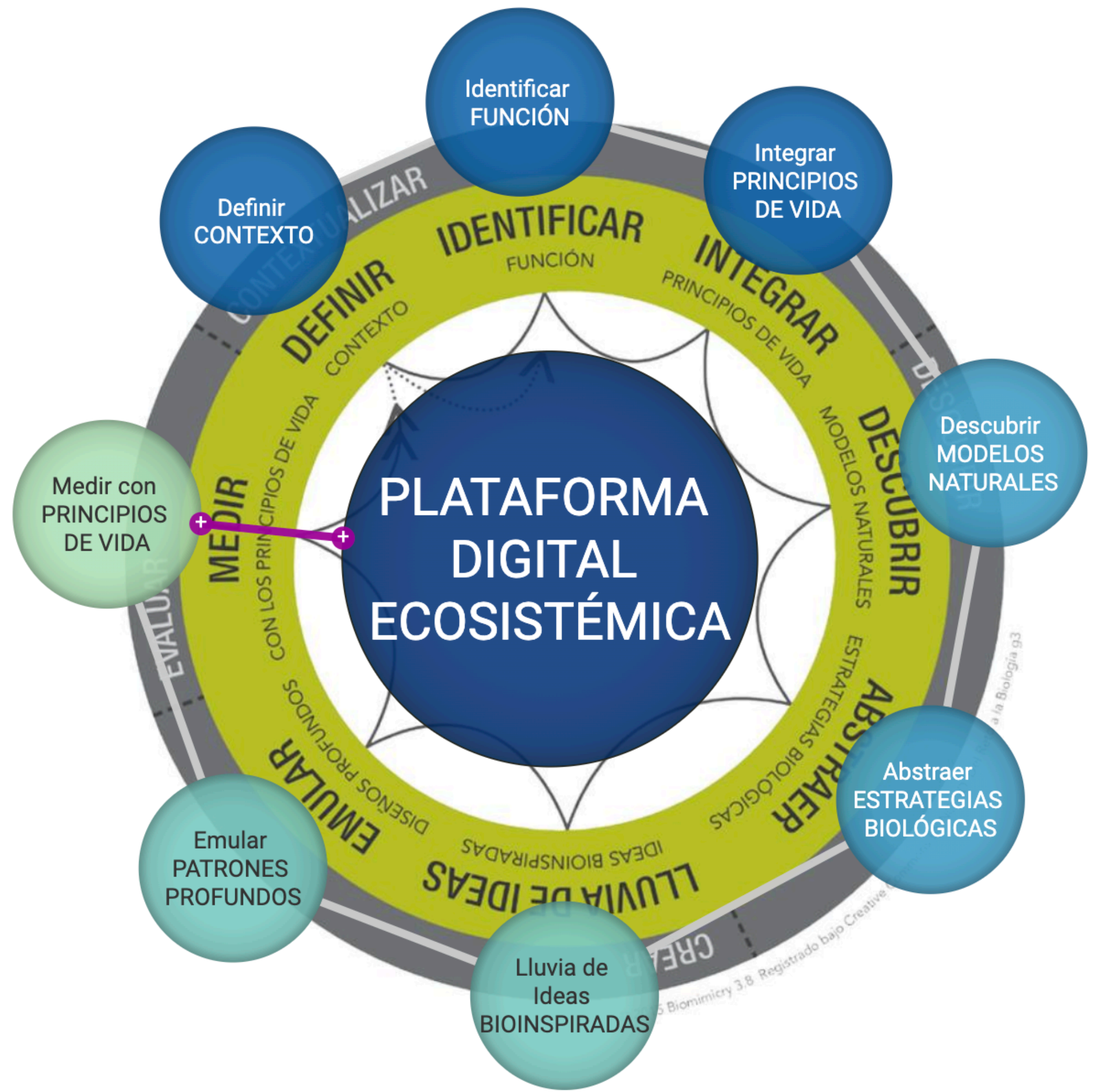
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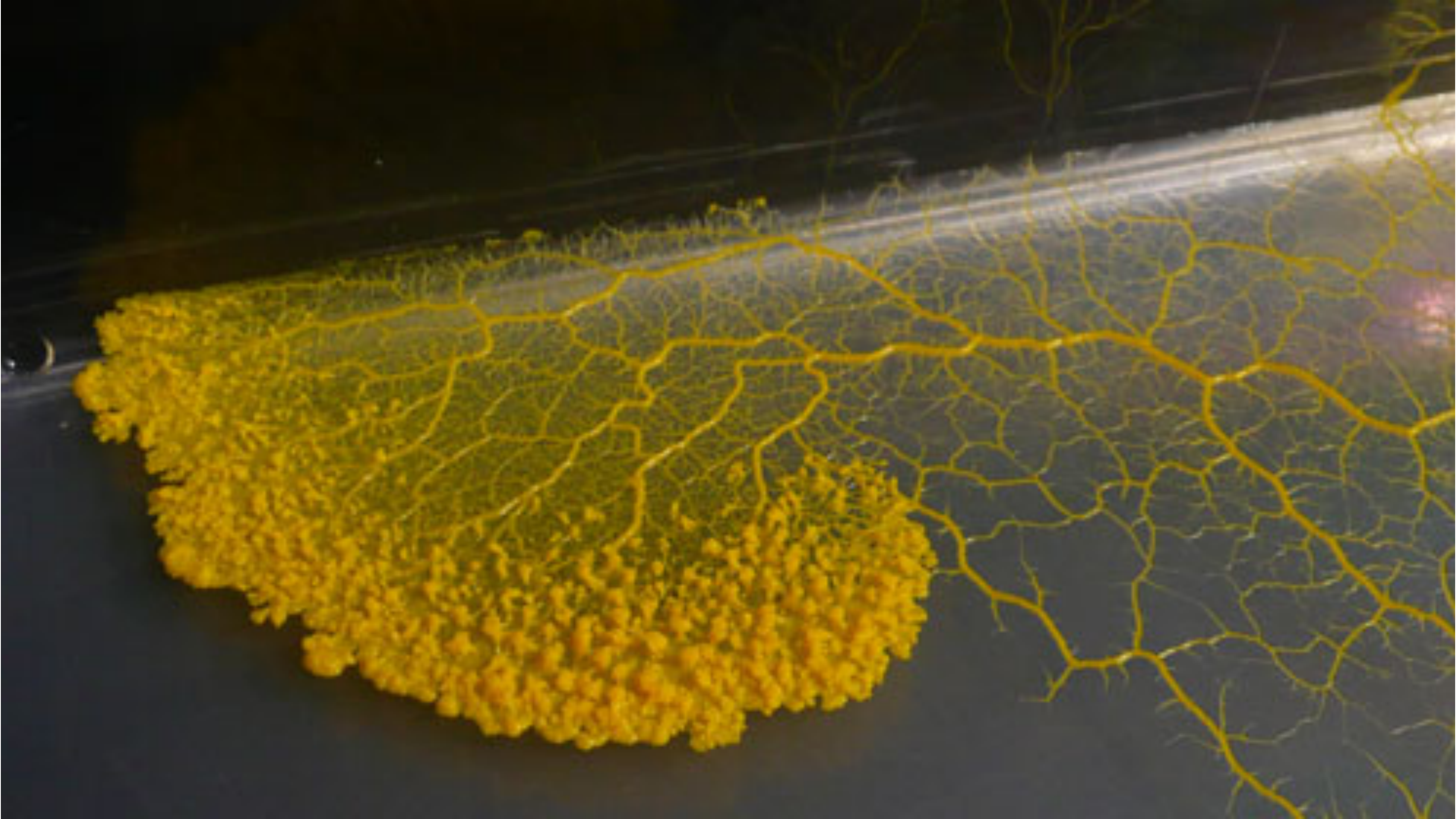
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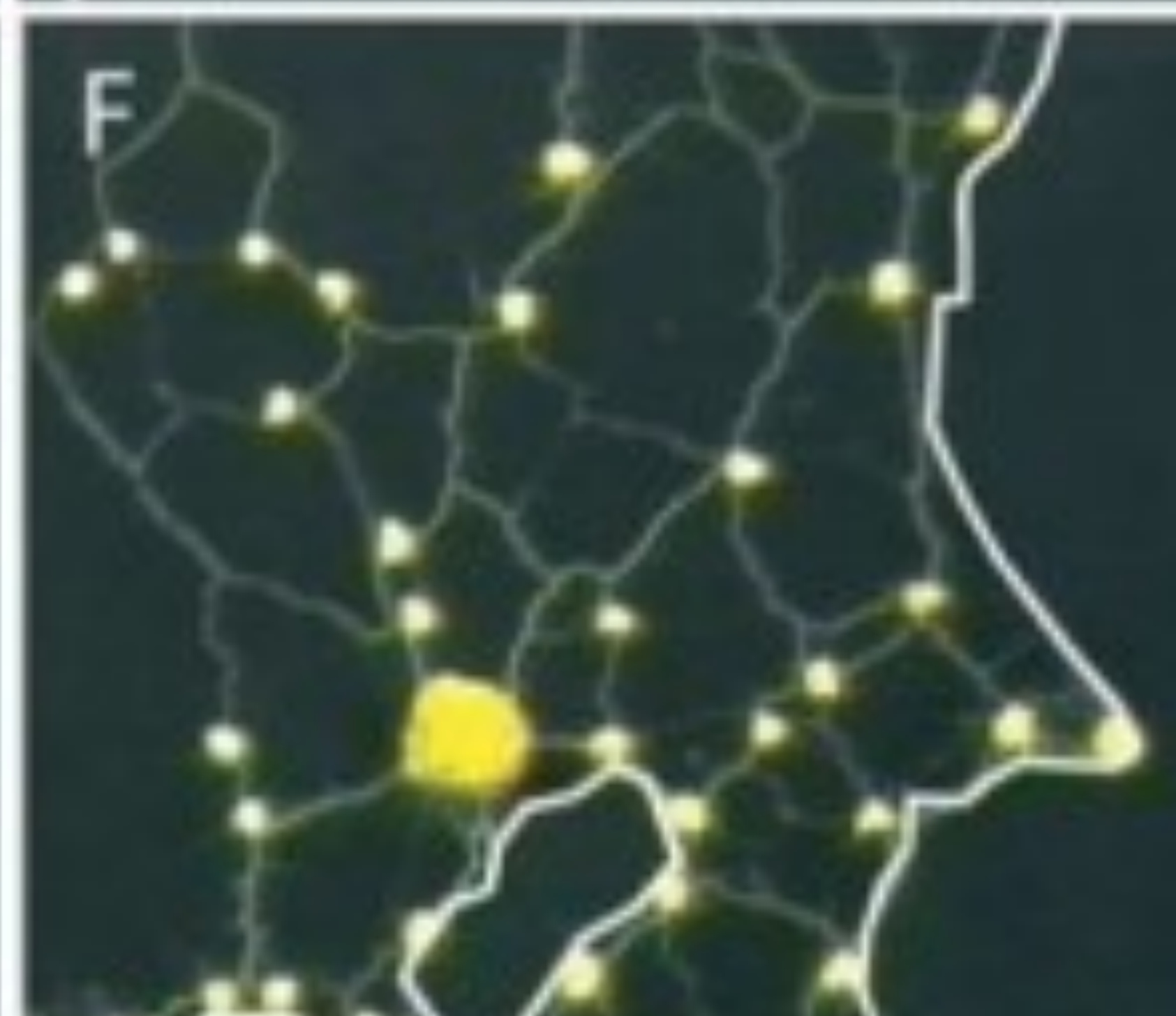
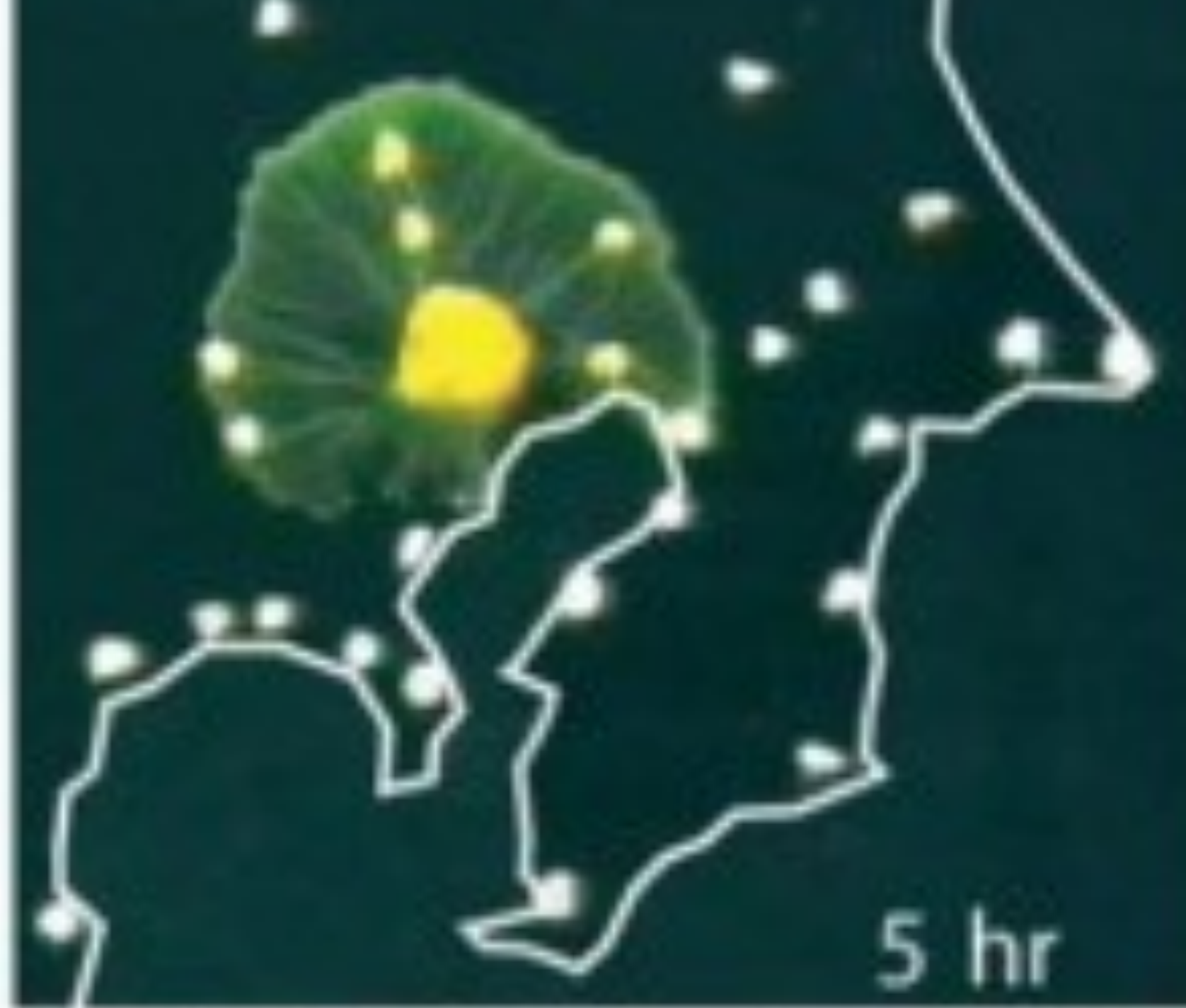
# DEL RETO A LA BIOLOGÍA

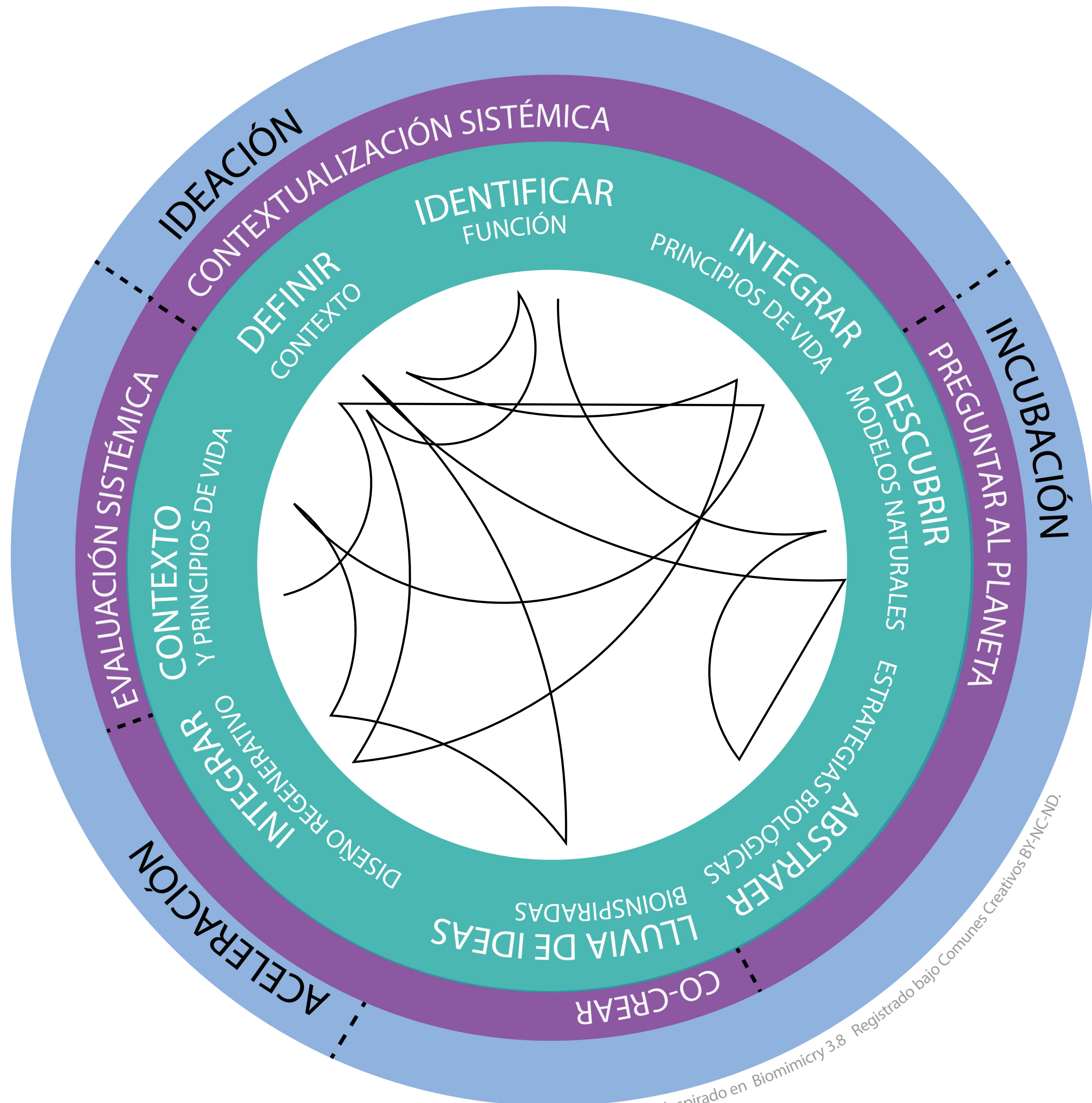


# Del reto a la Biología









Contexto del reto u organismo

Función

Principios de Vida

Modelos naturales directos

Abstracción de la estrategia biológica

Posibles aplicaciones

Diseño

Evaluación y contraste con contexto