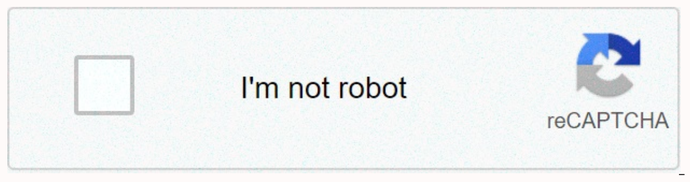


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**No exchange of gases occurs here**

The process by which gases are spread through the exchange of biological gases is the physical process by which gases move negatively by spreading across the surface. For example, this surface may be the air/water interface of a water object, the surface of a gas bubble in a liquid, a gas permeable membrane, or a biological membrane that forms the boundary between the organism and its extracellular environment. Gases are constantly consumed and produced from cellular and representative reactions in most living organisms, so an effective gas exchange system is needed between, ultimately, within the cell (cells) and the external environment. Small organisms, especially monocellular organisms, such as bacteria and protozoa, have a high percentage of surface area to size. In these creatures the gas exchange membrane is usually a cell membrane. Some small multicellular organisms, such as flat worms, are also able to make enough gas exchange through the skin or skin that surrounds their bodies. However, in most larger organisms, which have a small surface area to size ratios, specialized structures with twisted surfaces such as nostrils, pulmonary alveoli and mesophyll sponges provide a large area necessary for effective gas exchange. These sometimes twisted surfaces may be internal in the body of an organism. This is the case with the alveoli, which form the inner surface of the mammalian lung, and the spongy mesophyll, which is located within the leaves of some plant species, or the gills of those molluscs that contain them, which are found in the cloak cavity. In aerobic organisms, the exchange of gases is particularly important for breathing, which involves oxygen absorption (O2) and release of carbon dioxide (CO2). In contrast, the main gas exchanges that occur during the day in oxygen photon organisms such as most terrestrial plants, the absorption of carbon dioxide and the release of both oxygen and water vapor. Other gas exchanges are important in less knowledgeable organisms: for example, carbon dioxide, methane and hydrogen are exchanged through the cell membrane in the antique membrane of methanagenic. In nitrogen stabilization by diazotropic bacteria, nitrogen deprivation by non-heterogeneous bacteria (such as baroque suppository denitrificans and different pseudods), [1] nitrogen gas is exchanged with the environment, being edited by the former and released by the latter, while giant tube worms rely on bacteria to oxidize hydrogen sulphide extracted from their deep-sea environment,[2] using dissolved oxygen in water as an electron acceptance. The physical principles of the spread of gas exchange and surface area gas exchange occurs as a result of the deployment of the bottom of the concentration gradient. Gas molecules move from an area where they are at high concentration to an area where they are at low concentration. Propagation is a negative process, in the sense that no energy is needed Energy transport, follows the vic law: [need a source] J = - d d φ x {\displaystyle J=-D{\frac {d\varphi}{dx}} with regard to a typical biological system, where two compartments ('inside' and 'out'), separated with a membrane barrier, and where the gas is allowed to automatically spread down its concentration gradient: [need quote] J is a flow, and the amount of gas deployed each unit area of the membrane time. Note that this is already scaling for the membrane area. D is a propagation coefficient, which will vary from gas to gas, from membrane to membrane, according to the size of the gas molecule involved, and the nature of the membrane itself (especially for its viscosity, temperature and water). φ is the concentration of gas. X is the position across the thickness of the membrane. Dφ/dx so the concentration gradient across the membrane. If the two compartments are individually well mixed, this simplifies the difference in the concentration of gas between the inner and outer compartments divided by the thickness of the membrane. The negative sign indicates that propagation is always in a direction that, over time, will destroy the concentration gradient, i.e. the gas moves from high to low concentration until the inner and outer compartments eventually reach balance. Figure 1- The Vic's Surface Gas Act for gas exchange must first be dissolved in a liquid in order to spread through a membrane, so all biogas exchange systems require a wet environment. [3] In general, the higher the concentration gradient across the gas surface, the faster the propagation rate is across it. On the contrary, the thinner the gas exchange surface (for the same concentration difference), the faster the spread of gases through it. [4] In the equation above, J is an expressed flow of each unit area, so increasing the area will not make a difference to its value. However, an increase in the available space, will increase the amount of gas that can spread at a certain time. [4] This is because the amount of gas spreading in each unit of time (dq/dt) is the product of J and the gas exchange area surface, A: DDD = J {\displaystyle {\frac{{dq{dq}{dq}}ja} single-celled organisms such as bacteria and moebae do not have specialized gas exchange surfaces, because they can benefit from the high surface area they have relative to their size. The amount of gas produced by the organism (or requires) at a given time will be approximate to the size of the cytoplasm. However, as the object size increases, its size and size do not range in the same way. Considering a fictitious object that is a cube of side length, L. Increases its size with the cube (L3) of its length, but its outer surface area only increases with the square (L2) of its length. This means that the outer surface is rapidly becoming insufficient to meet the rapidly growing gas exchange needs for a larger volume of cytoplasm. In addition, the thickness of the surface to be crossed by gases (dx in vic law) can be larger in larger organisms: in the case of a single-cell organism, the typical cell membrane is only 10 nm thick; [5] but in larger organisms such as round worms (Nimtoda), the equivalent exchange surface - skin - is considerably thicker at 0.5 micrometres. [6] Interaction with circulatory organs Figure 2. A comparison of cocurrent processes and effects and a reverse flow exchange system is depicted by the upper and lower diagrams, respectively. In both it is assumed (indicated) that red has a higher value (e.g. temperature or partial pressure of gas) than blue and that property that is transported in the channels thus flows from red to blue. Note that the channels are contiguous if an effective exchange should occur (i.e. there can be no gap between the channels). Therefore, specialized respiratory devices such as nostrils or lungs are often used in multicellular organisms to provide additional space for the desired gas exchange rate with the external environment. No matter how long the gas exchanger and deep tissues are also great for deployment to meet the invasive requirements of these tissues. Gas exchanges are therefore often associated with circulatory systems that distribute gases, which evenly transmit gases to all tissues of the body, regardless of their distance from the gas exchange. [7] Some multicellular organisms such as flatworms (Platyhelminthes) are relatively large but very thin, allowing the surface of their external body to function as a gas exchange surface without the need for a specialized gas exchange device. Flat worms therefore lack nostrils or lungs, and the circulatory system. Other multicellular organisms such as sponges (purifra) have a naturally high surface area, because they are very porous and/or branched. Sponges do not require a circulatory system or specialized gas exchange devices, because their feeding strategy involves pumping water in one direction through their porous bodies using white collar cells. Therefore, each cell of the sponge body is exposed to a constant flow of fresh oxygenated water. They can therefore rely on spreading through cell membranes to exchange the gas needed for breathing. [8] In organisms that have circulatory systems associated with their specialized gaseous surfaces, a large variety of Used for interaction between the two. In the anticurrent flow system, the air (or, usually, the water containing the dissolved air) is drawn in the opposite direction to the blood flow in the gas exchanger. A reverse system like this maintains a sharp concentration gradient along the gas exchange surface (see bottom chart in Figure 2). This is the situation that is seen in the gills of fish and many other aquatic creatures. [9] Environmental gas-containing water is pulled unilaterally through the gas exchange surface, with blood flowing into the gilled capillaries beneath it flowing in the opposite direction. [10] Although this theoretically allows the near-complete transfer of respiratory gas from one side of the exchanges to the other, in fish less than 80% of the oxygen in the water flowing over the nostrils is generally transported to the blood. [9] Alternative arrangements across current systems are established in birds. [12] [13] A dead-end wind speed ingested air is a system in the lungs of mammals. [14] In the technflow system, blood and gas (or liquid containing gas) move in the same direction through the gas exchanger. This means that the size of the gradient is variable along the gas exchange surface, and the exchange will eventually stop when a balance is reached (see top chart in Figure 2). [9] To a conevent gas flow systems are not known to be used in nature. Mammals Figure 3. Alveoli (plural: alveoli, of Latin alveoli, small cavity), is an anatomical structure that has a hollow cavity shape. Mammals occur in the lung. They are outcroppingical of respiratory bronchi and the main sites for the exchange of gas with blood. Gas exchanger is absorbed in mammals to form lungs, as in most larger wild animals. [The need to cite] the exchange of gas occurs in air-filled mecocetic vesicles called alveoli, where a very thin membrane (called a blood air barrier) separates blood in alveoli capillaries (in the walls of the alveoli) from the alveoli air in the vesicles. Exchange membrane figure 4. A cross section of the tissue through a stomping wall shows the layers through which gases must move between the blood plasma and the alvero- air. Dark blue organisms are the nucleus of the type of capillary lining and boys i epithelial cells (or type 1 pneumocytes). The red bodies called RBC are red blood cells in the alveal capillary blood. The membrane through which gas exchange occurs in the alveoli (i.e. blood and air barrier) is extremely thin (in humans, on average, 2.2 micrometers thick). [14] It consists of epithelial cells, basement membranes and endothelial cells of pulmonary capillaries (Fig. 4). [14] [16] The large surface area of the membrane comes from folding of the to about 300 million vesicles, with diameters of 75-300 micrometers each. This saves a very large area (about 145 m2) through gas exchange. [14] Alveolar Air Figure 5. Changes in the formation of alvero-air during the normal breathing cycle at rest. The scale on the left, and the blue line, refers to the partial pressures of carbon dioxide in kPa, while on the right and the red line indicate partial oxygen pressures, as well as in kilo Pascal (to convert kilopascal to mmHg, multiplied by 7.5). Figure 6. A schematic tissue cross section through a portion of lung tissue that usually shows enlarged stones (at the end of a normal exhalation), and their walls containing alveur capillaries (shown in the cross section). This shows how the alvear capillary blood is completely surrounded by alvear air. In the normal human lung all the alveoli together contain about 3 liters of alveoli air. All alveastic capillaries contain about 100 ml of blood. Air is brought to the alveoli in small doses (called tidal volume), by breathing in (inhalation) and exit (exhalation) through the respiratory tract, a group of relatively narrow and moderately long tubes that begin in the nose or mouth and end in the alveoli of the lungs in the chest. The air moves in and out through the same group of pipes, where it is flowing in one direction during inhalation, and in the opposite direction during exhalation. During each inhalation, at rest, approximately 500 ml of fresh air flow in through the nose. They are heated and moistened as they flow through the nose and pharynx. By the time the trachea reaches the inhaled air temperature is 37°C and is saturated with water vapor. Upon arrival in the alveoli are diluted and fully mixed with approximately 2.5-3.0 liters of air that remained in the alveoli after the last exhalation. This relatively large volume of air which is semi-permanent is present in the alveoli throughout the breathing cycle and is known for its residual functional ability (FRC). [15] At the beginning of inhalation, the airways are filled with unchanged mammoic air, which has been left behind by the last exhalation. This is the size of a dead space, which is usually about 150 ml. [17] It is the first air to re-enter the alveoli during inhalation. Only after the dead space air has returned to the vesicles does not the rest of the tidal volume (500 ml - 150 ml = 350 ml) enter the alveoli. [15] The entry of such a small volume of fresh air with each inhalation ensures that frc composition barely changes during the breathing cycle (Fig. 5). [15] The partial pressure of dwarf oxygen is still very close to 13-14 kPa (100 mmHg), and the partial pressure of carbon dioxide varies slightly around 5.3 kPa (40 mmHg) throughout the breathing cycle (from inhalation and exhalation). [15] The Partial pressures of oxygen and carbon dioxide in the surrounding (dry) air at sea level are 21 kPa (160 mmHg) and 0.04 kPa (0.3 mmHg), respectively. [15] Figure 7. A very graphicillustration of the exchange of gas in mammalian lungs, emphasizing the differences between the gas formations in the surrounding air, the alvero-air (light blue) which balances the alveromy blood, the blood gas tensions in the pulmonary artery (blue blood enters the lung on the left) and venous blood (red blood leaves the lung on the right). All gas tensions in KPa. To convert to mmHg, multiply by 7.5. This alveuric air, which forms FRC, completely surrounds the blood in the alvex capillaries (Figure 6). Gas exchange occurs in mammals between this alvear air (which is significantly different from fresh air) and blood in alvee capillaries. Gases on both sides of the gas exchange membrane balances by simple propagate. This ensures that the partial pressures of oxygen and carbon dioxide in the blood leave the alvear capillaries, eventually rotating throughout the body, are the same as those in FRC. [15] The noticeable difference between the composition of the air and that of the ambient air can be maintained because the functional remaining function capacity contained in blocked populations connected to the outer air by long, narrow, tubes (the nasal tracts, blox, throat, stubble, popularity and their chances and subsections down to the sternum). This anatomy, the fact that the lungs are not emptied and re-amplified with each breath, provides mammals with a mobile atmosphere, whose composition differs significantly from the surrounding air nowadays. [18] The composition of air in FRC is carefully monitored, by measuring the partial pressures of oxygen and carbon dioxide in arterial blood. If either the gas pressure deviates from normal, reactions that change the rate and depth of breathing are obtained in a way that normal life is restored within seconds or minutes. [15] Lung main circulation substance: Pulmonary circulation all blood returning from the body's tissues to the right side of the heart flows through the alveroca capillaries before pumping them throughout the body again. On its passage through the blood lungs comes in close contact with the alveur air, separated from it by a very thin spread membrane which is only, on average, about 2 micrometers thick. [14] The blood pressure will quickly blend with those in the alveoli, ensuring that the arterial blood that circulates to all tissues throughout the body has an oxygen tension of 13-14 kPa (100 mmHg), and a co2 tension of 5.3 kPa (40 mmHg). These arterial micro-pressures of oxygen and carbon dioxide are generally controlled. High artery C O 2 {\displaystyle P_{{mathrm {CO}} {2}} and, to a lesser extent, a fall in the arterial P O 2 {\displaystyle P_ {mathrm {}{{2}}{mathrm}} will cause a deeper and faster reflexivity to breathe until the blood gaseous tension returns to normal. The opposite occurs when carbon dioxide tension falls, or, again to a lesser extent, increases oxygen tension: the rate and depth of breathing is reduced until normal blood gas is restored. Since the blood arriving in the capillaries has a P O 2 {\displaystyle P_ {\mathrm {{2}}} of, on average, 6 kPa (45 mmHg), while the pressure in the alveur air is 13 kPa (100 mmHg), there will be a net spread of oxygen in the capillary blood, changing the composition of 3 liters of slightly dwarf air. Similarly, since the blood arriving in the capillaries has P C O 2 {\displaystyle P_ {{{mathrm {CO} {_{2}}} of about 6 kPa ( 45 mmHg), while the percoceus air is 5.3 kPa (40 mmHg), there is a net movement of carbon dioxide from the capillaries in alveoli. The changes brought about by these net flows of individual gases in and out of the remaining functional capacity require that about 15% of the alveur air be replaced by the surrounding air every 5 seconds or so. This is controlled very tightly by constant monitoring of arterial blood gas tensions (which accurately reflect the partial pressures of respiratory gases in dwarf air) by aortic bodies, hibernation bodies, a blood gas sensor and hH on the anterior surface of the brain's marrow. There are also oxygen and carbon dioxide sensors in the lungs, but they primarily determine the diameters of the bronchi and the pulmonary capillaries, and are therefore responsible for directing air and blood flow to different parts of the lungs. However, as a result of strictly maintaining the composition of the 3-liter air, it is with each breath that some carbon dioxide is discharged into the atmosphere and some oxygen is taken from the outside air. If more carbon dioxide than usual has been lost by a short period of hyperventilation, breathing will be slowed down or stopped until {2} P_ returned to 5.3 kPa (40 mmHg). It is therefore precisely true that the basic function of the respiratory system is to rid the body of waste carbon dioxide. In fact, the total concentration of carbon dioxide in arterial blood is about 26 mAm (or 58 ml per 100 ml), compared to the oxygen concentration in saturated arterial blood of about 9 mam (or 20 ml per 100 ml of blood). [15] This high concentration of CO2 plays a pivotal role in determining and maintaining the PH grade of extracellular fluids. carbon dioxide that is breathed with each breath can probably be more It can be seen as a by-product of the body's extracellular liquid carbon dioxide and ass-hydroponics if these lesbians are at risk, then respiratory acidosis, or respiratory alkali will occur. In the long run these can be compensated by renal modifications to H+ and HCO3 - concentrations in plasma; But since this takes some time, hyperventilation syndrome can occur, for example, when emotion or anxiety causes a person to breathe quickly and deeply[20] thus blowing up a lot of CO2 of blood in the outside air, accelerating a range of painful symptoms caused by an excessively high PH degree of fluid outside the cell. [21] Oxygen has a very low melting in water, and therefore is loosely in the blood along with hemoglobin. Oxygen on hemoglobin is held by four heme groups containing iron for each hemoglobin molecule. When all heme groups carry one O2 molecule each is said to be oxygen-saturated, and no further increase in partial oxygen pressure will usefully increase the concentration of oxygen in the blood. Most carbon dioxide is transported into the blood such as HCO3-ions in plasma. However, the conversion of dissolved CARBON dioxide to HCO3 - (through the addition of water) is very slow for the rate of blood circulation through tissues on the one hand, and alvee bristles on the other. The refore the reaction is stimulated by carbon anhydrase, an enzyme within red blood cells. [22] The reaction can go either way depending on the prevailing partial pressure of co2. A small amount of carbon dioxide is performed on the protein portion of hemoglobin molecules as the Kramono groups. The total concentration of carbon dioxide (in the form of bicarbonate ions, dissolved CO2, carbaamino groups) in arterial blood (i.e. after it has been balanced with alvear air) is about 26 mAm (or 58 ml/100 ml),[19] compared to the concentration of oxygen in saturated arterial blood of about 9 mam (or 20 ml/100 ml of blood). [15] Other vertebrates are fish in T. The nostrils of tuna show filaments and lamellae dissolved oxygen content in

fresh water is approximately 8-10 milliliters per liter compared to the air which is 210 milliliters per liter. [23] The water is 800 times denser than the air[24] and 100 times more viscous. [23] Therefore, oxygen has a penetration rate in the air 10,000 times greater than water. [23] Using lungs such as a cyst to remove oxygen from water will therefore not be effective enough to sustain life. [23] Instead of using the lungs, the gas exchange is carried out through the surface of the gills with high blood vessels. Nostrils are specialized devices containing filaments, which are divided into more lami. Capillaries contain capillaries that provide large space and short spread distances, as their walls are very thin. [25] Jill Rickers Found inside the drainage system in order to filter food, keepthe nostrils clean. Nostrils use an anti-current flow system that increases oxygen absorption efficiency (and waste gas loss). [10] [11] Oxygenated water is pulled through the mouth and passes through the gills in one direction while blood flows through the lami in the opposite direction. This countercurrent maintains strong concentrations along each of the capillaries (see chart in the interaction section with circulatory systems above). Oxygen is able to spread down the gradient in the blood, and carbon dioxide down its gradient in water. [10] Diosigenide water will eventually pass through the operculum (gill cover). Although corresponding drainage systems theoretically allow the semi-complete transfer of respiratory gas from one side of the exchanges to the other, in fish less than 80% of the oxygen in the water flowing through the gills is generally transported to the blood. [9] Amphibians have three main organs involved in the exchange of gas: lungs, skin and nostrils, which can be used in a specified way or in a variety of different groups. The relative importance of these structures varies according to age, environment and amphibian species. Amphibian skin and larvae are high blood vessels, leading to a relatively efficient gas exchange when the skin is wet. Amphibian larvae, such as the sherve phase before the transformation of frogs, also have external gills. The nostrils are absorbed into the body during the transformation, after which the lungs will take over. The lungs are usually simpler than in other earth vertebrates, with a few internal Septa and larger vesicles; However, frogs, which spend more time on Earth, have a larger alveur surface with more sophisticated lungs. To increase the rate of gas exchange through propagation, amphibians maintain concentration gradient across the respiratory surface using a process called clitoral pumping. [26] The basement of the mouth is moved in an infusion manner, which can be observed with the naked eye. All reptiles breathe using the lungs. The squamates (lizards and snakes) are stimulated by axial muscles, but this is also the use of muscles during movement, so some squamates rely on pumping bauxal to maintain efficient gas exchange. [27] Due to the rigidity of the turtle and turtle shells, it is difficult to expand and shrink significantly in the chest. Turtles and turtles rely on muscle layers attached to their shells, which wrap around their lungs to fill and empty them. [28] Some aquatic turtles can also pump water into the mouth or high-blood-vessel cloaca to achieve gas exchange. [29] Crocodiles have a similar structure to diaphragm mammals - diaphragm - but these muscles help to create Air flow through the lungs rather than the tidal flow: this is more similar to the airflow seen in birds than those seen in mammals. [31] During inhalation, the diaphragm pulls the liver back, pumping the lungs into the space created by this. [32] Air flows to the lungs from the bronchi during inhalation, but during exhalation, air flows from the lungs to the bronchi through a different path: this movement is achieved in one direction of gas by the bronchial valves. [34] [35] Birds main article: Bird Anatomy § Respiratory Figure 10. Cycle of exhalation in birds. Figure 9. Official representation of respiratory gas exchanges through the current in the lungs of birds. Air is forced from unidirectional alveoli (right to left in the graph) through parabronchi. The pulmonary capillaries surround the Para-Bronchi in the described way (blood flowing from under the paraprunch to above it in the diagram). [12] Blood or air appears with high oxygen content in red; Oxygen-poor air or blood appears in different shades of purple and blue. Birds have lungs but no diaphragm. They are mostly dependent on aerobic hobbies for ventilation. These air links do not play a direct role in the exchange of gas, but help to move one-way across the gas exchange surfaces of the lungs. During inhalation, fresh air is taken from the trachea down to the rear vents and to the barbronchi which leads from the rear alveoli to the lung. The air that enters the lungs joins the air that is already in the lungs, and is drawn forward via the gas exchanger in the anterior air yak. During exhalation, the rear air caps force air in the same parabronchi of the lungs, flowing in the same direction during inhalation, allowing continuous gas exchange regardless of the breathing cycle. The air coming out of the lungs during exhalation joins the air that is expelled from the anterior air ducts (both consisting of spent air that passed through the gas exchanger) entering the trachea to be exhaled (Fig. 10). [13] Selective bronchial impregnation at various bronchial branch points ensures that air does not recede and flows through the airways during inhalation and exhalation, as in mammals, but follows the routes described above. One-way air flow through paraponci exchange respiratory gases with blood flowing through the current (Fig. 9). [12] [13] Partial pressure of O2 (P O2 {\displaystyle P_{{mathrm{O} {_{2}}} in parabroncchios decreasealong as O2 spreads in the blood. Capillaries leaving exchanges near the airflow inlet take more O2 than capillaries left near the exit end of parabronchi {2} P_. from the inhaled air. [12] [13] Gas exchange stations at stations are dominated by the roles of carbon dioxide, oxygen and water vapour. Carbon dioxide is the only carbon source of otropic growth by photosynthesis, and when the plant is actively photosynthesis in light, it will eat carbon dioxide, the loss of water vapor and oxygen. At night, the plants are implemented, and the gas exchange partially reflects: water vapor is still lost (but to a smaller extent), but oxygen is now taken and carbon dioxide is released. [36] Figure 11. A stylized cross section of euphyllophyte plant leaf, showing the main plant organs involved in the gas exchange gas exchange plant occurs mostly through the leaves. Gases are spread inside and outside the spaces between cells within the leaf through pores called stomata, which are usually found on the lower surface of the paper. Gases enter the photonic tissue of the leaf by melting on the wet surface of palisades and spongy mesuphile cells. Medium sponge cells are packed loosely, allowing surface area to increase, thus increasing the rate of gas exchange. Co2 absorption necessarily results in some loss of water vapor,[37] because both molecules enter and leave by the same stomata, so plants experience the dilemma of gas exchange: gain enough carbon dioxide without losing too much water. Therefore, water loss is reduced from other parts of waxy skin paper on the paper skin. The size of the stoma is regulated by the opening and closing of two guard cells: the exhaustion of these cells determines the state of the lulate aperture, and this is itself regulated by water stress. Plants that show crassulacean acid metabolism are xerophytes carrying dehydration and performing almost all their gas exchange at night, because only during the night that these plants open their stomata. By opening stomata only at night, the loss of water vapor associated with co2 absorption is reduced. However, this comes at the expense of slow growth: the plant must store carbon dioxide in the form of malic acid for use during the day, and cannot store unlimited quantities. [38] Figure 12. High-resolution gas exchange measurements reveal important information on gas exchange measurements in plant physiology that are important tools in botany: this usually involves sealing the plant (or part of the plant) in a room and measuring changes in co2 concentration with the infrared gas analyzer. If environmental conditions (humidity, co2 concentration, light and temperature) are fully controlled, co2 absorption and water release measurements reveal important information on CO2 absorption and exposure rates. The concentration of carbon dioxide between cells reveals important information on the state of photosynthesis of plants. [39] [40] Simpler methods can be used in Conditions: The carbon index can be used to monitor co2 consumption in a solution containing a single leaf at different levels of light density,[41] oxygen generation can be measured by pondweed diada simply by collecting gas in a submerged test tube containing a small piece of plant. The mechanism for gas exchange in invertebrates depends on their size, feeding strategy and habitats (aquatic or terrestrial). Figure 13. A graph representing the structure of the body of purifra. The graph shows the mechanism of water absorption of sponges. Yellow: pinacocytes, red: choanocytes, gray: mesohyl, pale blue: flow of sponge water (Porifera) are sessile creatures, meaning they are unable to move on their own and usually remain attached to the substrate. They get food through the flow of water through their cells, and they exchange gases through simple spread through their cell membranes. Pores called ostia draw water into the sponge and water is later circulated through the sponge by cells called choanocytes that have structures such as hair that move water through the sponge. [42] Figure 14. Cnidarians are always found in aquatic environments, which means that the exchange of gas involves the absorption of oxygen from water. They include coral reefs, sea anemones, jellyfish and hydra. These animals are always found in aquatic environments, from fresh water to saltwater. They don't have any custom respirators; Instead, every cell in the body can absorb oxygen from the surrounding water, releasing waste gases into it. One of the main disadvantages of this feature is that cnidarians can die in environments where water is stagnant, as it depletes water from the oxygen supply. [43] Coral reefs often form symbiotics with other organisms, particularly photosynthesis of dinoflagellates. In this symbiosis, coralprovides shelter and the other organism provides nutrients for corals, including oxygen. Figure 15. Cross section of nematodes. Round worms (Nematoda), flatworms (Platyhelminthes), and many other small fastic animals living in otherwise damp aquatic or damp habitats do not have a surface dedicated to gas exchange or circulatory system. It depends on the spread of carbon dioxide and O2 directly through the skin of the scents. [44] Skin is the semi-permeable outer layer of their bodies. Other aquatic invertebrates such as most molluscs (Molucca) and larger crustaceans (crustaceans) such as lobsters, have gills similar to those of fish, which work in a similar way. Figure 16. Photographic representation of spiracles. Unlike the groups of invertebrates mentioned so far, insects are usually terrestrial, exchanging gases across a humid surface in direct contact with the atmosphere, rather than touching the surrounding water. The insect's exoskeleton is unable to gas, including water So they have a more specialized gas exchange system, which requires gases that are transported directly to tissues through a complex network of pipes. This respiratory system is separated from the circulatory system. Gases enter and leave the body through openings called spiracles, and are then located along the chest and abdomen. Similar to plants, insects are able to control the opening and closing of these towers, but instead of relying on turgore pressure, they depend on muscle contractions. [46] These contractions lead to an insect's belly being pumped out. Spirakils are connected to tubes called trachea, which branch over and over again and threaten the insect's body. These branches end up in specialized trachea cells that provide a thin and moist surface for efficient gas exchange, directly with the cells. [47] The other major group of arthropods, arakvaned (spiders, scorpions, moths, and their relatives) usually lead to the exchange of gas with a book lung. [48] Summary of the main gas exchange systems surface area deployment after keeping concentration devices producing a human respiratory device total [49] = 70-100 m2 olive and dre (two cells) constant blood flow in the Drillels; Breathing lungs many fish lamellae and filaments in one generation usually one cell reverse flow nostrils nostrils specialized larvae tracheole cell single cell Buccal pumping Spiracles sponge ostia pores one water cell movement there is no flat body worm usually flat body shape one cell Countercurrent flow no Cnidarians arms oral usually one The water cell movement is nothing many reptiles for lamlai and filaments for each generation [clarify the need] Alveolus and vermicelli (cells) anti-flow of many amphibian lungs lamellae and threads in the generation of elo and battery (cells) or single cell flow anti-pulmonary current, skin and gills of high-density plants of stomata; Vacuums air within paper one cell constant air flow Stomata also respiratory system – biosystem in and plants for gas exchange references

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