Kafrelsheikh University Department of Biomechanics

Examiner Name: Prof.Dr. Anees Saleh Ghiet	
Course Title: Biomechanics 1	**Date: 2019 / 2020**
Year :Second year	**Time:** 2 hours
Pages: 11 page	**Total Mark:** 50 Marks

BIOMECHANICES (1)

Put true or false : (25 marks)

1- Numbers of bones, muscles & joints of skeleton (1206).
2- Osteoclasts is small cells that breakdown bone matrix.
3- Function red bone marrow is storage of lipids .
4- Bone with aging , becomes more ductile.
5- Bone with mobilization , becomes weaker .
6- Periosteum function, forming pathways for blood vessels and exchange nutrients and wastes .
7- Endosteum is active in bone growth and repair .
8- Cortical bone mineralized, low porosity, found in diaphysis.
9- Trabecular bone undergo more deformation before fracturing.
10- Bone is not homogenous and elastic in all directions.
11- Bone has different stiffness depending on structure plus direction of applied load.
12- Short bones provide surfaces for muscle attachments.
13- Bones grow in circumference through outer layer of periosteum.
14- One third of bone matrix is collagen .
15- Osteoid is mineralized bone matrix composed of PG , glycoproteins, and collagen .
16- Osteogenesis done by osteoblasts .
17-Osteocytes do not divide & not help repair damaged bone .
18- Osteoclasts dissolve bone matrix and release stored minerals (osteolysis) .

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32- Hysteresis loop on the stress strain curve is the shaded area represents lost energy (heat).

33- Ductility is ability of material to resist propagation of cracks as in metals.

34- In the ultimate failure point we found resistance of material to fracture when suddenly stressed.

35-Wolff's Law (1892): bone adapts to increased use (bed rest) or disuse (physical activity) .

36- Bone strength affected by water content of bone which comprises 25%-55% of weight .

37- Bone exposed to rapid applied loading absorb less energy than slow applied loading .

38- Cortical bone is stronger & stiffer in transverse directions .

39- Bone strength affected by bone porosity which defined as the amount of bone volume filled with pores or cavities .

40- Energy absorbing capacity of spongy bones in compression bigger than that in cortical bone .

41- Site of Stress Fractures: Navicular - 12.2% .

42- Up to13-52 % of military recruits exposed to stress fracture .

43- High risk sites of stress fractures: Base of fifth metatarsal .

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3- Red bone marrow :
A-It supplies nutrients to osteocytes in trabeculae .
B-Forms red and white blood cells .
C-Both a and b D-Neither a nor b .

4-Low back pain and back disorders associated with:
a- Frequent lifting . b-Whole-body vibration.
b- Repeated shocks . d-All of the above .

5- Remodeling Of Bones:
a-Turnover rate is the same within and between bones
b-Remodeling recycles
c-Remodeling renews bone matrix . d-Both a and b

6- Bone Deposition :
a-Occurs where added strength is needed .
b-Requires a diet poor in vitamins C, D,and A.
c-Alkaline phosphatase is essential for mineralization of bone .
d-Both a and c .

7- Bone Resorption :
A-Osteoblast secrete lysosome enzymes that digest organic matrix .
B- Involving acids that convert calcium salts into soluble forms.
C-Dissolved matrix transcytosed across osteoblast where secreted into interstitial fluid and then into blood .
D-all of the above .

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15- Paget's Disease :
a-Excessive high ratio of spongy to compact bone formed .
b-Increase mineralization c-Spotty weakness of bone .
d-Both a and c .

16- Bone :

a- Consists of inorganic components only .

b- Consists of organic components only.

c- Is one of the body's hardest structures. d-All of the above .

17- Compression :

A- Pushing forces that are axially directed.

B- Force that tries to squeeze a material.

C-Shorting and widening occur . D-All of above .

18- When the tibial tuberosity experiences excessive loads from quadriceps muscle group develop condition known as:
A-Chondromalacia patella . B-Osgood-Schlatter's disease .
C-Knee osteoarthritis . D-rheumatoid arthritis .

19-The breaking point of tibia on compression :
a-192 kg b-600 kg c-756 kg d-450 kg

20-The breaking point of femur on compression :
a-192 kg b-600 kg c-756 kg d-450 kg

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30-Fibers provides articulation with resistance to stress and strain:

A-Collagen B- PG C-Both of them D- Neither of them

31- Arrangement of collagen fibers in cartilage:

a- 2 zones b- 4 zones c-5 zones d- 6 zones

32-Superficial zone of cartilage represents :

a-1-2 % of thickness b- 10-20% of thickness

c-20-25 % of thickness d-25-30 % of thickness

33-Superficial zone of cartilage consists of fibrils parallel to surface, to resist :

A-Compressive strength B-Tensile strength.

C-Both a and b C-Neither a nor b

34-Middle zone of cartilage consists of fibrils distributed oblique to resist :

A-Compressive strength B-Tensile strength

C-Both a and b C-Neither a nor b

35- Deep zone of cartilage consists of fibrils perpendicular to calcified zone, to resist :

A-Compressive strength B-Tensile strength

C-Both a and b C-Neither a nor b

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44-Eversion stress ankle leads to :

A-Lateral malluolus fracture B- LCL torn

C- BOTH A AND B D- Deltoid ligament torn

45-Closed packed position of ankle :

A-Dorsi B- Plantar C- Eversion D- Inversion

46-Loose packed position of ankle :

A-Dorsi B- Plantar C- Eversion D- Inversion

47-Closed packed position of hip :

A-flexion B- extension C- medial rotation D- lateral rotation

48-Loose packed position of hip :

A-flexion B- abduction C- lateral rotation D- all of the above

49-Closed packed position of shoulder :

A-flexion B- extension C- medial rotation D- lateral rotation

50-Loose packed position of shoulder :

A-extension B- abduction C- lateral rotation D- both b and c

With my best wishes

Prof -Dr ANEES SALEH SOLIMAN

B.Sc.,M.Sc.,Ph.D.PT,DPT

Electrotherapy 1

Second Year (1st Semester)
Kafrelsheikh University
Faculty of Physical Therapy
Basic Sciences Department

Date: 19/1/2020
Time Allowed: two Hours
Total Marks: 50 Marks
Number of Pages: 8

iii. Put (√) or (x) for each statement. (.5 grades for each)

1. Perception of pain is the end result of the neuronal activity of pain transmission.T
2. The modulation of pain involves changing or inhibiting transmission of pain impulses in the brain somatosensory area. T
3. Ultrasound and short wave can heat larger areas than other penetrating agents. F
4. The Micro massage effect of ultrasound occurs at a cellular level where the cells are alternately compressed and then pulled further apart. T
5. The waves of compression and rarefaction may produce a form of Micromassage, which could increase edema. F
6. Ultrasound can promote collagen synthesis by increasing cell membrane permeability T
7. Shock wave encourages the growth of new capillaries in necrotic tissue and the same could happen during repair of soft tissues after injury. T
8. Ultrasound is considered to improve the extensibility of mature collagen such as is found in scar tissue. T
9. Ultraviolet are usually defined in terms of their wavelengths, extending the violet end of the visible at 390 nm to 400 nm to the soft X-ray region. F
10. Increasing tissue temperature in acute stage cause vasodilatation and increased blood flow. This may decrease pain and or enhance recovery. T
11. IRR is a source of conductive heating. T
12. IRR is transmitted through air. T
13. US need a medium to be transmitted. F
14. Luminous sources of IR emit mainly near IR T
15. Increase temperature of skeletal muscle leads to decrease activities of muscle receptors. T
16. US velocity is higher in gases than in solids and liquids. T
17. Unstable cavitation is more dangerous than stable cavitation. T
18. Heat leads to decrease pain by direct stimulation of sensory nerves. T
19. DVT contraindicated to the application of thermal agent. T
20. Far IRR can penetrate to the dermis. F
21. During application of US, under water technique used to decrease reflection. T
22. There is inverse relationship between frequency of US and penetration. T
23. Cavitation alter cell permeability. T
24. To stimulate wound healing, US showed be used at high intensity. F
25. Erythema of IRR is longer in time to disappear than erythema of UV. T

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62. In short wave therapy:

A. inductive method is deeper. **B. capacitive method is deeper.**

63. Capacitive application produces more heating in:

A. adipose tissue. **B. muscular tissue.**

ii. **Matching (Choose the best answer from Colum II)** **(grades)**

	I		II
64	**Afferent neurons**	A	May result from damage to the peripheral nervous system (PNS),
65	**Neuropathic pain**	B	also called motor neurons
66	**Chronic pain**	C	also called sensory neurons
67	**Efferent neurons**	D	Burning., dull., Aching

I	II
68. **Functions of the skin**	A. Assist in vit D production.
69. **Connective tissues**	B. The outer surface of the skin
70. **UV**	C. Helps regulate temperature.
71. **The epidermis**	D. Tend to be vascular (have a rich blood supply).

I	II
72. **Functions of the skin**	A. Assist in vit D production.
73. **Connective tissues**	B. The outer surface of the skin
74. **UV**	C. Helps regulate temperature.
75. **The epidermis**	D. Tend to be vascular (have a rich blood supply).

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A. Dorsal column damage. A

B. Spinocerebellar damage.

54. Clumsy movements are signs of

A. Spinocerebellar tract damage. A

B. Dorsal column damage.

55. Factors Involved in Opening and Closing the Gate control of pain.

A. The amount of activity in the pain fibers.

B. Messages that descend from the brain. C

56. A case of a vascular necrosis of head of femur can be treated using:

A. Extracorporeal shock wave therapy. A

B. LASER therapy.

57. Shockwave effects:

A. Stimulation of activity of osteoblasts. A

B. Stimulation of activity of osteoclast.

58. ultraviolet radiation appears to trigger immunosuppressive effects this occurs because :

A. UVB destroys Langerhan's cells. C

B. Stimulates the proliferation of suppressor T cells.

59. Photosensitization:

A. Process in which a person becomes overly sensitive to UVR.

B. Acute effects of UVR exposure may be exacerbated if certain chemicals or medications are present on skin. C

60. Pulsed shortwave can only be non thermal if: C

A. short pulses, low pulse repetition. B. short treatment duration.

61. in short wave, If we placed one electrode closer to the skin than the other.

A. Heat will be more near the closer electrode. A

B. Heat will be deeper near the closer electrode.

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43. A case of chronic sprain could be treated by .....

A. IR B. UV

44. Ultrasound contraindicated in case of .....

A. Open wound B. Fracture healing

45. At which interface, the highest percent of US is reflected.....

A. Water-Soft tissue interface B. Soft tissue-Fat interface.

46. Increase tissue temperature leads to improve cell function due to.....

A Increase enzymatic activities B. Denaturation of enzymes

47. Lowest rate of US absorption occurs in .....

A. Bone B. Fats.

48. The Arndt–Schultz principle states that:

A. no reactions or changes can occur in the body tissues

B. if the amount of energy absorbed is sufficient to stimulate the absorbing tissues.

49. Energy in the non-ionizing range can:

A. Readily alter the components of atoms (electrons, protons, and neutrons).

B. IR is apart of that range.

50. Non luminous sources:

A. penetrate up to dermis

B. penetrate up to epidermis.

51. Ultraviolet radiation:

A. Is higher in energy than IR

B. Can be used with ricket child.

52. Spinothalamic pathway:

A. 2nd neuron crosses over in spinal cord; ascends to thalamus

B. 3nd neuron crosses over in spinal cord; ascends to thalamus

53. Sensory ataxia:

A. largely absorbed in the outer layer of the skin. C
B. direct effects are limited to those on the skin and the eyes.

32. Degree of erythema of ultraviolet divided into:
A. **E1** has Approximate duration of erythema < 24 hours with obvious skin oedema. d
B. **E3** has Approximate latent period < 2 hours with blister appearance

33. The redness caused by ultraviolet radiation:
A. is uniform, mottled in appearance. B
B. there is a sharp distinct edge at the junction with an unexposed area.

34. important cutaneous vasodilator are:
A. Histamine substances. A
B. nitric oxide.

35. the rate of tissue heating by US is influenced by:
A. the blood flow.
B. *heat conduction.* C

36. Transdermal drug delivery through ultrasound known as:
A. sonophoresis B
B. Phonophoresis

37. Ultrasound:
A. Used in conditions like ***Dupuytren's contracture.***
B. Used on cartilaginous epiphyseal plates of children. d

38. In patients with Blood pressure abnormalities:
A. I.R.R should be given to large area. B
B. I.R.R may be allowed to small area.

39. A case of post immobilization adhesion treated by...

A. US d **B. UV.**

40. The non-thermal effects US means C

A. Mechanical affects **B. electrical effect.**

41. To improve healing of bone use.....

A. Pulsed US A **B. Laser**

42. To improve the healing of open wound use.....

A. Infrared **B. Continuous ultrasound**

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22. The large regions of radiation with longer wavelengths than infrared radiations are known as:

A. The diathermies.
B. They penetrate tissues more deeply than infrared or visible light.

23. Frequency and Wavelength are important factors in electromagnetic spectrum

A. Wavelength is defined as the distance between the peak of one wave and the peak of succeeding wave.
B. Frequency is defined as the number of wave oscillations or vibrations occurring in a particular time unit.

24. The action potential sequence:

A. is not essential for neural communication.
B. It reasonable about physiological changes in the tissues.

25. Moving the transducer head during the treatment:

A. Is important to concentrate ultrasound wave on tissue and avoid stable cavitations.
B. This movement also reduces shear wave formation and thereby reduces chances of periosteal pain.

26. ultrasound is one of important electrotherapy modalities:

A. is particularly well-suited to heat such as tendons, ligaments.
B. US is generally not the ideal physical agent for heating muscle tissue

27. cavitations is one of important physiological effects of ultrasound:

A. Stable cavitations have hazard effects on tissue.
B. while Transient cavitations have the most desired physiological effects.

28. The human body is composed of four basic types of tissues;

A. Epithelium, connective muscular, and nervous tissues.
B. These tissues the same in their composition and their function.

29. Neurons contain some specialized structures for example:

A. synapses.
B. Chemicals (for example, neurotransmitters).

30. Pain may be due to accumulation of waste product of metabolism in the tissue, so increased blood flow through the part by IR will Lead to:

A. Increase of chemical mediators which cause irritation of nerve ending which lead to relief of pain.
B. Decrease edema by assistance of lymphatic system.

31. Ultraviolet radiations are:

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11. **Biofeedback is:**
A. Process that enables an individual to learn how to change physiological activity.
B. Precise instruments measure physiological activity such as brainwaves. C

12. **Biofeedback is based on the principle of:**
A. Motor learning.
B. Sensory learning. C

13. **Shock wave is;**
A. transient acoustic wave C
B. a noninvasive procedure that uses sound waves.

14. Shockwaves used in:
A. **Achillodynia.**
B. Epicondilitis. C

15. Chemical pain stimulus
A. As excitatory neurotransmitter A
B. As burn

16. tissues with a high water and electrolyte content
A. Such as muscle or synovial fluid A
B. Have low electrical conductivity

17. Acute pain is:
A. A pathological response that warns us of danger B
B. A physiological response that warns us of danger.

18. Effects of U.S
A. Pain reduction C
B. Revascularization.

19. The UV erythema 4 are found to have:
A. blisters C
B. Painful.

20. Heat from any source
A. Has a primary thermal effect C
B. Secondary effects in hyperemia, sedation.

21. far infrared is either far or near where:
A. Far IR reduces acute edema of the hand and foot
B. Near IRR reduce acute edema. d

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I. Multiple choice questions **(.5 for each grades)**

Choose A if the 1st sentence is true. Choose B if the second sentence is true.
Choose C if the two sentences are true. Choose D if the two sentences are false.

1. **Type A nerve fibers**
A. Have a diameter of 1.5-20 micron
B. Are the smallest and thinnest.

2. **Electromagnetic waves are**
A. Mechanical waves.
B. Waves those are capable of traveling through a vacuum.

3. **the various forms of radiant energy are refracted or change direction as a result of differences in:**
A. Frequency.
B. Wavelength.

4. **The longest wavelength light is**
A. Red
B. Violet.

5. **Wavelength is defined as:**
A. as the distance between the peak of one wave and the peak of either the preceding wave
B. number of wave oscillations or vibrations occurring in a particular time unit.

6. **Since all forms of electromagnetic radiation travel at a constant velocity through space, so**
A. The longer the wavelength of a wave, the lower the frequency of the wave has to be.
B. The shorter the wavelength of a wave, the lower the frequency of the wave will be.

7. **If too much radiation is absorbed by superficial tissues:**
A. Enough will be absorbed by the deeper tissues.
B. Not enough will be absorbed by the deeper tissues.

8. ultrasound at a frequency of 1 MHz
A. has deep penetrations.
B. Has superficial penetrations.

9. visible light, infrared, microwave, radio waves are examples of:
A. **non-ionizing** radiation.
B. **ionizing** radiation.

10. **Conduction** is:
A. The direct transfer of energy between two objects in physical contact with each other.
B. Occurs when a medium, such as air or water, moves across the body.

KAFR EL-SHEIKH UNIVERSITY
FACULTY OF PHYSICAL THERAPY
ANATOMY DEPARTMENT
29-12-2019

2nd YEAR
FINAL EXAM
TOTAL TIME: 2 HOURS
TOTAL MARKS: 50 marks

Neuro-anatomy

All questions are to be answered :

1. **Mention the followings :.....(20 marks)**
   - **a. origin, function and termination of medial and lateral lemnisci**
   - **b. site, functions of functional area of frontal and temporal lobes**
   - **c. functions of five nuclei of the thalamus and their connections**
   - **d. site , shape and content of the tela choroidae of the third and fourth ventricles**
2. **Enumerate the following:.....(10 marks)**
   - a. branches of basilar artery
   - b. contents of anterior and posterior limb of internal capsule
   - c. input of paleocerebellum and neocerebellum
3. **Discuss the deep origin and functional component of glossopharyngeal nerve .....(5 marks**
4. **Draw the following diagrams:.....(5 marks)**
   - **a. cross section in the mid brain at the level of inferior colliculus**
   - **b. coronal section of the brain at level of parietal lobe**
5. **Choose the correct answer .....(10 marks):**

1- The corticospinal fibers are broken into bundles in:

a- Basis pontis
b- Tegmental part of pons
c. Basis pedunculi
d. Tegmentum of midbrain

2- Regarding the anterior spinal artery select the correct answer:

a- Arises from vertebral artery
b- Supplies medulla oblongata
c. Is a single trunk
d. All of the above

3- The functional component of the vagus nerve include the following:

a. taste sensation from posterior 1/3 of tongue
b. motor to the muscle of pharynx and larynx
c. parasympathetic to lacrimal gland
d. general sensation from the face

4- which nerve provides parasympathetic innervation to the submandibular salivary glands?

a- facial (VII)
b- hypoglossal (XI)
c- glossopharyngeal (IX)
d- trigeminal (V)

5- which of the following does not arise from the vertebral arteries :

a. the posterior cerebral artery
b. basilar artery
c. middle cerebral artery
d. cerebellar arteries

6- The typical signs of the facial nerve damage are the following:

a- Dysphagia
b- inability to whistle
c. paresis of the tongue
d. depressed eyebrow reflex

Kafrelsheikh University - Faculty of Physical Therapy
Final examination in Pathology (2) for third level students
Date: 22-1-2020
Time allowed: 2 hours
Total marks: 80

Answer the following questions (All questions to be answered):

I. Choose the correct answer: (20 marks)

1. Which of the following granulomatous diseases is characterized by caseation necrosis?

A. Leprosy	B. Schistosomiasis	C. Syphilis	D. Tuberculosis

2. Which of the following lesions does not occur in tuberculoid leprosy?

A. Neural lesions	B. Skin lesions	C. Trophic lesions	D. Visceral lesion

3. Which of the following lesions is responsible for the development of "closed intestinal bilharziasis"?

A. Fibrosis	B. Polyps	C. Sandy patches	D. Ulcers

4. Which of the following chromosomal aberrations occurs in Down syndrome?

A. Insertion	B. Deletion	C. Non-dysjunction	D. Translocation

5. Which of the following adaptations occur in Barrette's oesophagus?

A. Atrophy	B. Hyperplasia	C. Hypertrophy	D. Metaplasia

6. What is the mode of infection in malaria?

A. Bite of vector	B. Ingestion	C. Inhalation	D. Injection

7. Which of the following is a late manifestation of congenital syphilis?

A. Mucous patches	B. Pneumonia alba	C. Sabre tibia	D. Syphilitic rhagades

8. Which of the following organs is the main site to which bilharziasis of the urinary bladder spreads?

A. Bone	B. Brain	C. Lung	D. Liver

9. Which of the following types of atrophy occurs in the brain due to cerebral atherosclerosis?

A. Endocrine	B. Ischaemic	C. Neuropathic	D. Pressure

10. Which of the following is a common site for cutaneous candidiasis?

A. Abdomen	B. Axilla	C. Chest	D. Face

11. What is the name of the parasitic disease that causes abscess in the liver containing chocolate coloured material?

A. Amoebiasis	B. Bilharziasis	C. Malaria	D. Toxoplasmosis

12. Which of the following tumour grades has the best prognosis?

A. Grade 1	B. Grade 2	C. Grade 3	D. Grade 4

13. Ghon's focus is a component of which of the following primary complexes?

A. Intestinal	B. Pulmonary	C. Skin	D. Tonsillar

14. Which of the following is a common site of metastases in malignant tumours?

A. Brain	B. Bronchus	C. Heart	D. Large intestine

15. What is Pott's disease?

A. Tuberculosis of long bones	B. Tuberculosis of short bones	C. Tuberculosis of ribs	D. Tuberculosis of vertebrae

16. Which of the following tumours causes osteosclerotic bone metastases?

A. Colorectal carcinoma	B. Prostatic carcinoma	C. Renal cell carcinoma	D. Thyroid carcinoma

17. Which of the following types of tuberculous peritonitis have the best prognosis?

A. Caseous	B. Dry	C. Encysted	D. Wet

18. Which of the following stages of Schistosoma causes "verminous pneumonia"?

A. Cercaria	B. Dead ova	C. Dead worms	D. Living worms

19. What is the content of cold abscess?

A. Blood	B. Caseous material	C. Cholesterol crystals	D. Pus

20. Which of the following is not a manifestations of secondary acquired syphilis?

A. Alopecia	B. Clutton's joints	C. Condyloma lata	D. Leucoderma

II. Match the word(s) on the right column with the related ones on the left column: (20 marks)

21. HIV	A. Anchovy sauce
22. Moniliasis	B. CD4+T cells
23. Amoebiasis	C. Hydrophobia
24. Rabies	D. Oral thrush

****

25. Tuberculosis	A. Caput Medusa
26. Leprosy	B. Gumma
27. Syphilis	C. Langhan's giant cells
28. Schistosomiasis	D. Trophic lesions

****

29. Barrett's oesophagus	A. Disuse atrophy
30. Poliomyelitis	B. Squamous metaplasia
31. Pancreatic duct obstruction	C. Neuropathic atrophy
32. Urinary bladder bilharziasis	D. Columnar metaplasia

****

33. Papilloma	A. Malignant tumour of surface epithelium
34. Carcinoma	B. Malignant tumour of connective tissue
35. Sarcoma	C. Benign tumour of glandular origin
36. Adenoma	D. Benign tumour of surface epithelium

Kafrelsheikh University

Faculty of physical therapy

Second year 1st term

Physiology 3

Time: two hours

15/1/2020

Answer the following questions?

Q1- Mention the metabolic functions of the following hormones? **(20 marks)**

A- Thyroxin.

B- Glucocorticoids.

C- Insulin

Q2- Explain the mechanism of HCL secretion and factors affecting it? **(10 marks)**

Q3- Compare between? **(10 marks)**

A- Fast and slow pain.

B- Primary and secondary hyperalgesia.

Q4- Adaptation of receptors: definition, types and mechanisms? **(10 marks)**

Best wishes

Dr. Hani Borg